A DICTIONARY

OF

TERMS USED IN PRINTING.

BY

H. MORGAN,

GOVERNMENT PRINTING ESTABLISHMENT.

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It has been the endeavour of the compiler of this little volume, to give a great deal of useful information in a small compass. Whether he has succeeded, or not, he must leave others to judge.

He does not intend to put himself forward as a rival to "Savage," or any other English writer on the subject; but he hopes to be of some assistance to the Printers of Madras.

Under the heads, *Apprentice*, *Lay up*, *Distribute*, *Composing*, *Spacing*, *Make up*, *Imposing*, *Correcting*, *Clicker*, *Companionship*, *Overseer*, *Reader*, *Abbreviation*, *Division*, *Orthography*, *Phrases*, *Punctuation*, *&c.*, he has endeavoured to give instructions which may help to make good workmen, or enable persons in charge of presses, who are not Printers, to understand better what are the duties of the workmen in their employ.

Fine Presswork, *Making ready*, *Rollers*, and many minor heads, are intended for the instruction of Pressmen as well as of those who have them in charge. While under *Printing*, *Type-founding*, *Machines*, *Paper*, *Stereotyping*, will be found brief notices of the Discovery and progress of Letter Press Printing.

Short notices of *Engraving on Copper*, *Steel*, and *Wood*, *Electrography*, *Glgphography*, and *Lithography* have also been inserted, as being peculiarly connected with the Art of Printing.

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A DICTIONARY OF TERMS USED IN PRINTING.

Abbreviations.—Contracted words; or, in old books, marks used to denote them. The following list will be found to contain nearly all the abbreviations in ordinary use.

A.	Of the first class.
A.	Anna, Annas.
A.A.G.	Assistant Adjutant General.
A.B.	"ArtumBaccalaureus," Bachelor of Arts.
Abp.	Archbishop.
Abs.sta.	Abstract statement.
Abt.	About.
A.C.	"Ante Christum," before Christ.
ac.	acre, acres.
a/c	Account.
Acad.	Academy.
Acc. or Act.	Account.
A.D.	"Anno Domini," in the year of our Lord.
A.D.	Ante Diem.
Ad. Arbit.	"Ad arbitrium," at pleasure.
Ad. or Adv.	Adverb.
Adj.	Adjective.
Adjt.	Adjutant.
Ad. lib.	"Ad libitum," at liberty, at option.
Admrs.	Administrators.
Ad. val.	"Ad valorem," According to value.
Affy.	Affectionately.
A.G.	Adjutant General.
A.H.	"Anno Hegiræ," the year of the Hegira.
Albt.	Albert.
Ald.	Alderman.
Alex.	Alexander.
Alf.	Alfred.
Alt.	Altitude.
A.M.	"Artium Magister," Master of Arts.
A.M.	"Anno Mundi," in the year of the world.
A.M. or a.m.	"Ante Meridiem," morning before midday.
A.N.C.	"Ante nativitatem Christi," before the birth of Christ.
And.	Andrew.
Angl.	"Anglice," in English.
Ann.	"Annum," year; or "Annual."
Anon.	Anonymous.
Ans. or Ansr.	Answer.
Antiq.	Antiquities.
Ap. Apr. or Apl.	April.
Ap. wt.	Apothecaries Weight.
Aq.	"Aqua," water.
A.Q.M.G.	Assistant Quarter Master General.
A. R.	"Anno Regni," in the year of the reign.
Archb.	Archbishop.
Archd.	Archdeacon.
Archt.	Architect.
Arith.	Arithmetic.
Art.	Article.

Asst.	Assistant.
Astron.	Astronomy, or Astronomical.
Att. Gen.	Attorney General.
Atty.	Attorney.
A.U.C.	" Ab. urb. condita," from the building of the city.
Aug. or	Augt. August.
Av. wt.	Avoirdupois weight.
B.A. (*see*	A.B.) Bachelor of Arts
Bart.	Baronet.
Barth. or	Barthol. Bartholomew.
B.C.	Before Christ.
B.C.L.	Bachelor of Civil Law.
B.D.	Bachelor of Divinity.
Bd.	Bound.
Bds.	Boards.
Ben. or	Benj. Benjamin.
B.I.	British Institution.
Bd.'s Min.	Board's Minute.
Bd.'s Or.	Board's Order.
Bib. Im.	" Bibliotheque Imperial," Imperial Library.
Biog.	Biography.
Bk.	Book.
B.L.	Bachelor of Laws.
B.M.	Bachelor of Medicine.
Bnk.	Bank.
Bot.	Bought.
Bp.	Bishop.
Bque.	Barque.
Br.	Bridge.
Br.	British.
Brit.	British, Britain, Britannia.
Brf.	Brief.
Bt.	Baronet.
B.V.	Blessed Virgin.
B.V.M.	Blessed Virgin Mary.
Cal.	Calendar.
C.A.	Chief Accountant.
Cal. Rom.	" Calendarium Romanum," the Roman Calendar.
Car. Sec.	Carmen Seculare.
Cat.	Catechism, Catechise.
Cat.orCatt.	Catalogue.
C.B.	Companion of the Bath
C.C.	Crown Clerk.
Cel. Phen.	Celestial Phenomena.
Ch.orChas.	Charles.
Ch. Cl.	Chief Clerk.
Ch. Magis.	Chief Magistrate.
Ch. Off.	Chief Office.
Chron.	Chronology, Chronicle
Cit.	Citizen.
C.J.	Chief Justice.
Clk.	Clerk.
C.M.	"ChirurgicalMagister"
C.M.G.	Companion of the Order of St. Michael and St. George.
C.O.	Crown Office.
Col.	Colonel, Colonial.
Coll.	Collector.
Comp.	Compare.
Compy.	Company.
Compts.	Compliments.
Conj.	Conjunction.
Cons.	Consultation.
Contd.	Continued, contained.
C. P. Spa.	Common Pleas Subpœna.
Cr.	Credit, Creditor.
Cri. Dept.	Criminal Department.
C.S.	"CustosSigilli," Keeper of the seal.
C.S.	Civil Service.
Curt.	The current month.
Cus. Rot.	" Custos Rotulorum," Keeper of the Records.
Cwt.	A hundred weight.
Cor. Mem.	CorrespondingMember

D. or d. "Denarius," a penny, "Denarii," or "Denaria," pence.
D.A.A.G. Deputy Assistant Adjutant General.
D.A.C.G. Deputy Assistant Commissary General.
D.A.G. Deputy Adjutant General.
Dan. Daniel.
Dble. Double.
Dbt. Debit.
D.C.G. Deputy Commissary General.
D.C.L. Doctor of Civil (or Canon) Law.
D.D. "Divinitatis Doctor," Doctor of Divinity.
Dec. Decrease.
Dec. or Decr. December.
Deft. Defendant.
Dep. or Dept. Department.
Depy. Deputy.
Dy. Diary.
D.F. Dean of Faculty.
D.G. "Dei Gratia," by the Grace of God.
Dict. Dictionary.
Diff. or Diffce. Difference.
Dipl. Diplomacy, Diplomatic, Diplomatist.
Dist. District.
Div. Division, divide.
Divnd. Dividend.
D.L.O. Dead Letter Office.
Do. "Ditto," the same.
Doz. Dozen.
D.Q.M.G. Deputy Quarter Master General.
Dr. Debtor.
Dr. Doctor.
Dr. Drachm.
D.V. "Deo Volente," God willing.
Dwt. Pennyweight.
Ecc. or Eccles. Ecclesiastical.
Ed. Editor.
Ed. Edward, Edwin, Edmund.
Edit. Edition.
Edits. Editors, Editions.
E. E. Errors excepted.
E. G. "Exemplia Gratia," as for example.
Edw. or Edwd. Edward.
E.I.C. East India Company.
E.I.C.S. East India Company's Service.
Eliz. Elizabeth.
E. M. "Equitum Magister," Master of the Horse.
Emp. Emperor, Empire.
E.N.E. East North East.
Eng. English, England.
Entd. Entered.
Ent. Sta. Hall. Entered at Stationer's Hall.
Env. Ex. Envoy Extraordinary.
Eph.Term. Epiphany Term.
Eq. Equal, equivalent.
E.S.E. East South East.
Esq. or Esqre. Esquire.
Et al. "Et alibi," and in other
Et al. freq. "Et alibi frequenter," and in many other passages.
Et int. al. "Et inter alia," and amongst others.
Etc. Et cetera.
Eur. Europe.
Ev. or Evg. Evening.
Ex. Example.
Exch. Exchange.
Exch. Bds. Exchequer Bonds.

Exd.	Examined.
Exors.	Executors.
Ext.	Extra, Extract.
Extr.	Extract.
Extra.	Extraordinary.
F. A.	Fine Arts.
Fac.	Factor, Factory.
Fah.	Fahrenheit.
F.A.S.	Fellow of the Antiquarian Society.
Fcp.	Foolscap.
Feb. or Feby.	February.
Fem.	Feminine.
F.G.S.	Fellow of the Geographical Society.
Fid. Def.	"Fidei Defensor," Defender of the Faith.
Fig.	Figure.
F. M.	Field Marshal.
Fo. or Fol.	Folio.
F.R.A.S.	Fellow of the Royal Astronomical Society.
F.R.C.S.	Fellow of the Royal College of Surgeons.
F.R.S.	Fellow of the Royal Society.
F.S.A.	Fellow of the Society of Antiquaries.
Ft.	Foot, or Feet.
Gall.	Gallon.
Gaz.	Gazette.
G.C.B.	GrandCross of theBath
Gen.	Gender, Genitive.
Gen. or Genl.	General.
Gent.	Gentleman.
Geo.	George.
Geog.	Geography, geographical.
Geol.	Geology, geological.
Geom.	Geometry, geometrical
G.M.K.P.	Grand Master of the Knights of St.Patrick.
G.O.	General Order.
G.O.C.C.	General Order by the Commander-in-Chief.
G.O.G.	General Order by the Governor.
Gov.	Governor, Govt.
G.P.O.	General Post Office.
Gr.	Grains.
Gram.	Grammar.
Hab. Corp.	"Habeas Corpus," (a writ.)
H.B.M.	HerBritannicMajesty
H.H.	His (or Her) Highness
Hist.	History, Historical.
H.M.	His (or Her) Majesty.
H.M.S.	His (or Her) Majesty's Ship.
Hon.	Honorable.
Hon. or Hony.	Honorary.
Hon. Sec.	Honorary Secretary.
Hor.	Horace.
H.P.	Horse Power.
H.R.H.	His (or Her) Royal Highness.
Ib. Ibid.	"Ibidem," the same as before named, in the same place.
I.E. or i. e.	that is.
Id.	"Idem" the same.
I.G.	Inspector General.
I.H.S.	"Jesu Hominum Salvator," Jesus the Saviour of Men.
Imp.	Imperial.
In.	Inch, Inches.
Incog.	"Incognito," in disguise.
Infra dig.	"Infra dignitatem," beneath one's dignity.

Int. al.	"Inter alia," amongst other.
Insp.	Inspector.
Inst.	"Instant," the present (i.e. current) month.
Int.	Interest.
Inv.	Invoice.
I. O. U.	I owe you.
Ion.	John.
Jac.	Jacob.
J.A.G.	Judge Advocate Genl.
Jas.	James.
J.D.	"Juris Doctor," Doctor of Law.
Jno.	John.
Jos.	Joseph.
Jr. or Jnr.	Junior.
J.W.D.	"Juris utriusque Doctor," Doctor of both Laws.
Junr.	Junior.
K.B.	Knight of the Bath.
K.C.M.G.	Knight Commander of St. Michael and St. George.
K.G.	Knight of the Garter.
K.G.C.B.	Knight Grand Cross of the Bath.
Knt.	Knight.
K.P.	Knight of St. Patrick.
K.T.	Knight of the Thistle.
Kt.	Knight.
L. £, or *l.*	"Libra," or "Libræ," pound (20s.) or pounds.
L.	Line.
Lat.	Latitude.
Lb. or lbs.	Pound (16oz.) or pounds
Ld.	Lord.
Ldp.	Lordship.
Lib.	"Liber," Book.
Librn.	Librarian.
Lieut.	Lieutenant.
Lin. meas.	Lineal measure.
Lit.	Literary, literal.
LL.B.	"Baccalaureus Legum," Bachelor of Laws.
LL.D.	"Legum Doctor," Doctor of Laws.
Lon. or Long.	Longitude.
Lond.	London.
M.A. (*v.* A. M.)	Master of Arts.
Mag.	Magazine.
Maj.	Major.
Mar.	March.
Mas. or Masc.	Masculine.
Matt.	Matthew.
M.B.	Bachelor of Medicine.
Mch.	March.
M.D.	"Medicinæ Doctor," Doctor of Medicine.
Mde.	Madame.
Mlle.	Mademoiselle.
Mem.	Memento.
Memo.	Memorandum.
Mema.	Memoranda.
Messrs.	"Messieurs," Masters, (plural of Mr.)
Mil. Mily.	Military.
Min.	Minute.
Mond.	Monday.
M.P.	Member of Parliament
M.R.A.S.	Member of the Royal Academy of Science
Mr.	Mister.
Mrs.	Mistress.
M.S.	Manuscript.
M.SS.	Plural of M.S.
Mnt.	Mount.
Mtn.	Mountain.
N.	North.
Nat.	Nathaniel.
Nat.	Natural.
Nat. Hist.	Natural History.
Nav.	Navigation, navigable.

N.B.	"Nota bene," mark well.
N.E.	North East.
Neh.	Nehemiah.
Nem. con.	"Nemine contradicente" no one contradicting.
Nem. diss.	"Nemine dissentiente,' no one dissenting.
N.N.E.	North North East.
N.N.W.	North North West.
No.	"Numero," number.
Nom.	Nominative.
Non. com.	"Non compos (mentis,") not of a sound mind.
Non. Seq.	"Non sequitur," it does not follow.
Nos.	Plural of No.
Nov.	November.
N.W.	North West.
Obj.	Objective.
Obs.	Observe, observation.
Obt. or	Obdt. Obedient.
Oct.	October.
Oct.	Octavo, (also written 8vo.)
Op.	"Opus," work; or "Opera," works.
O.S.	Old Style.
Oz.	Ounce, Ounces.
P.	Pies, pice.
p.	page.
Part.	Participle.
Parl.	Parliament.
Pd.	Paid.
Ph. D.	Doctor of Philosophy.
Phil. Trans.	Philosophical Transactions.
P.M.	"Post Meridiem," after mid-day.
pp.	Pages.
Pr.	Pronoun.
Prep.	Preposition.
Pro. Proc.	Proceedings
Pro loc. et tem.	"Pro loco et tempore," for the place and time.
Pro tem.	For the time.
Prof.	Professor.
Prox.	"Proximo," the coming month.
P.S.	"Post Scriptum," Postscript.
P.T.O.	Please turn over.
Pt.	Pint.
Q.	Question, Query.
Q.C.	Queen's Council.
Q.D.	"Quasi dicat," as if he should say.
Q.E.D.	"Quod erat demonstrandum," which was to be demonstrated.
Q.M.	Quarter Master.
Q.M.G.	Quarter Master General.
Qrs.	Quires.
R.	Rupee, Rupees.
R.A.	Royal Academy.
Rd.	Road.
Rec. or	Rect. Received, receipts
Ref.	Reference.
Regd.	Registered.
Regt.	Regiment.
Rel.	Relative.
Rept.	Report.
Reqd.	Required.
Rev. or	Revd. Reverend.
Rev.	Revenue.
Rev. Bd.	Revenue Board.
R.H.	Royal Highness.
R.M.	Royal Marine.
R.M.A.	Royal Military Asylum
Rm.	Ream.
R.N.	Royal Navy.
Rn.	Roan.

Rom.	Roman.
Rt.	Right.
Rt. Hon.	Right Honorable.
Rt. Rev.	Right Reverend.
S.	South.
S. or s.	"Solidus," a shilling; "solidi," shillings.
Sam.	Samuel.
Sans.	Sanscrit.
Sat.	Saturday.
Sax.	Saxon.
S.E.	South East.
Sec.	§, Section.
Sec. or Secy.	Secretary.
Sept.	September.
Seq.	"Sequor," following.
Serj. or Serjt.	Serjeant.
Serv. or Servt.	Servant.
S.l.p.	Without lawful issue.
Soc. or Socy.	Society.
Sol. or Soli.	Solicitor.
Sov.	Sovereign.
Sovs.	Sovereigns.
S.P.C.K.	Society for Promoting Christian Knowledge.
Sq. or Sqr.	Square.
St.	Saint.
Str.	Street.
S.S.E.	South South East.
S.S.W.	South South West.
Sun.	Sunday.
S.W.	South West.
Tam.	Tamul.
Tel.	Telegu.
Th. or Thurs.	Thursday.
Th	affixed to numerals marks them ordinal.
Tho'	Though.
Thos.	Thomas.
'Tis.	It is.
Topog.	Topography.
Trans.	Translator, Translated.
Trans.	Transaction.
Treasr.	Treasurer.
Tu. or Tues.	Tuesday.
Typ.	Typography, Typographer.
Ult.	"Ultimo," the last month.
Univ.	University.
U.S.	United States.
v.	"Versus," against.
v.	Verb.
v.a.	Verb active.
Var.	Various.
Ven. or Ven'ble	Venerable.
Vict.	Victoria.
Verb. et lit.	"Verbatim et literatim," word for word and letter for letter.
Viz.	"Videlicet," that is to say; or, namely.
v.n.	Verb neuter.
Vol.	Volume.
v.p.	Verb passive.
V.R.	"Victoria Regina," Victoria the Queen.
W.	West.
Wed. or Wednes.	Wednesday.
Wk.	Week.
W.L.	West Longitude.
W.N.W.	West North West.
Wm.	William.
W.S.W.	West South West.
X. or Xt.	Christ.
Xm. or Xmas.	Christmas.
Xn. or Xtian.	Christian.
Xty.	Christianity.
Yrd., Yd.	Yard.
Yds.	Yards.
Yr., Yrs.	Year, Years.
Yt.	That.
&	"Et" and.
&c.	"Et cetera," & other.

Accents.—Certain marks over vowels, to direct the modulation of the voice. In the English Language they are chiefly used in Spelling books or Dictionaries, to mark the syllables, and where to lay particular stress in the pronunciation.—*Murray.*

Albion Press.—An iron press, invented by Mr. R. C. Cope. It is of great power, and smooth and easy in working.

Alphabet.—Letters, or characters to denote the articulate sounds of a language.

Anastatic Printing, or *Zincography.*—A method of printing from zinc, in the same manner as from stone, in lithography.

A printed page, an engraving, or a bank note may be exactly copied by this invention. Moisten the printed paper with dilute phosphoric acid, lay it face downwards on a clean sheet of Zinc, and put it in a press for a short time. The acid of the unprinted part etches the zinc beneath, while the printed part sets off on the zinc, and thus produces a reverse copy of the printing. Wash the plate with an acid solution of gum, and it will be ready for use. The plate may now be treated as the stone in Lithographic Printing ; first damped, and then rolled. The affinity of the ink to the letters already "set off" on the plate, and the repulsion of the other parts of the plate, cause the lines of the device to take the ink, but the other parts remain clean, the printing then follows. *See* Lithography.

Anti-penultimate.—The last syllable but two of a word.

Antique.—The name of a fancy type, with a thick, black face. Much used for striking lines, or headings in job work.

Apostrophe.—An apostrophe, marked thus, ' is used to abbreviate or shorten a word ; as '*tis*, for *it is ;* e'en, for *even*. Its chief use is to show the genitive case of nouns, as a man's bodkin ; a woman's cloth.

Apprentice.—A youth bound, articled, or indentured to a master, to learn any given trade or business. An Act, "No. XIX of 1850," concerning the "Binding of Apprentices," was passed by the Governor General of India in Council.

Every boy "bound" to learn the business of an English compositor, should be able to read and write the English language ; for if he cannot he will never be a swift workman, as he will be obliged to compare the types letter by letter with his copy, to his great loss of time, and yet will, most likely, pass numerous errors.

The most necessary endowments for a lad desirous of becoming a printer are, a considerable portion of bodily strength and activity ; an

eye for symmetry of form ; a willingness to be taught ; and a tone for reading and study. The most necessary acquirements are orderly and attentive habits, a grammatical knowledge of the language on which he is to be employed, and an acquaintance with arithmetic and book-keeping. But there are few branches of learning, or even of science a knowledge of which will not be found occasionally useful to a printer. Having adopted the trade, a lad cannot be too attentive to the proper performance of his duties ; and he should strenuously endeavour to obtain a clear comprehension of the principles of the process in which he is engaged, and of the united results of the details by which he is surrounded.

Many, I may say most master-printers, when a lad is first put to the business, give him *pie* to sort. This may make him well acquainted with the founts in an Office, but I have always found more pie made in the process. In my opinion, it is better to put a beginner to his case at once, to give him a frame, and set him to "learn his cases," that is, to find in what box each distinct letter is kept, capitals, small capitals, accents, and figures, lower case, double letters (ligatures), points, spaces, and quadrats. While learning his cases he should be stationed by the side of a good compositor, willing to act as a teacher, who should point out the uses of the various letters and spaces, and how to distinguish such types as b, d ; p, q ; n, u ; &c. This can be best done orally.

As soon as the learner knows where to find any letter required, he should have some copy given him, as plain and simple as possible (if reprint all the better), and should be allowed to *compose*, his teacher watching him, and if he goes to work awkwardly, as most beginners will, showing how to hold the stick conveniently, and how best to pick up the types. He should be instructed, too, to attend carefully to his spacing ; to have, as nearly as possible, the same space between the words throughout the line ; to space all the lines alike, driving out small words if necessary for the purpose, not spacing very closely for two or three lines, and then leaving gaps for two or three lines more. He should be taught, too, not to have a multiplicity of divisions, not to turn over such syllables as ed or an ; and in wide measures he should be shown that *all* divisions are unnecessary. When he knows the places of all the types, can tell the characters at a glance, can separate the *b*'s from the *d*'s, or *p*'s and *q*'s if mixed in pie, he may be allowed to distribute, but not till then. This, I am aware, is contrary to the general practice, but a moment's thought will show the system I advise to be the best. If a lad begins to distribute before he has a knowledge of his case, or of the metal characters, as a natural conse-

quence he puts sorts in the wrong boxes, and mixes many of the letters; that is, to use a technical expression, he "puts his case in pie." By teaching him to compose *first*, much of this is obviated; and, although he may compose very slowly, space badly, and perhaps make two or three "outs" or "doubles," his matter will not be so full of literal errors as if he had, before composing, distributed his letter.

When, by composing and distributing plain solid matter, the learner has obtained a perfect knowledge of one fount, he may be set to sort and distribute pie, and so become acquainted with the characteristics and difference in size and appearance of every variety of type in the office.

After attaining a tolerable proficiency in solid work, the learner should be allowed, still under the tuition of a thorough printer, to compose statements (or more properly, table work). At first he should be shown how to regulate the measures of his headings, and how to join his rules neatly and in a workman-like manner; but as soon as possible, he must be left to trust to his own judgment in these things, his tutor carefully pointing out when he is wrong, and invariably giving reasons for any alterations required, so that the learner may not for an instant suppose he has to do his work over again merely to gratify a whim of his teacher, and may know how to avoid similar errors in future.

As the Apprentice improves in his workmanship, he should be allowed to set small "jobs," "titles," &c., his tutor explaining to him how to pick the principal lines, when to use light or heavy types, condensed or bold characters, and what may be kept in smaller type, as comparatively unimportant.

The teacher, while his pupil is learning to compose, should observe and check the false (or useless) movements which many compositors indulge in. Some tick the letter two or three times against the stick before placing it; some bow and bend as if they were salaaming to the case or copy; some jerk the type about every time they pick up a letter; while others grope and scramble as though it were of the first importance to get at the bottom of the case without using the letter at the top.

These movements cause much time to be lost, and also damage the types, and the Apprentice should therefore be careful to avoid them. (For further instructions, *see* "Compositor, &c.")

I cannot do better than to insert, in this place, an address to young people learning the printing business, extracted from a little book on the "Results of Printing" which was published in England in 1855.

" And now, before I conclude, a word or two to those who have just
" entered into the profession—an honorable and useful one, and, as I
" have endeavoured to show not without its reward. You have been
" admitted within the porch of this literary building. If you have no
" ambition but to pass your time as hodmen or paddy labourers, are
" satisfied with being able to follow your copy, without caring to
" understand whether it is sense or otherwise, like the Chinese tailor,
" who being employed to make a pair of breeches, and having an old
" pair given to him as a pattern of size—not only produced a pair of
" the precise dimensions, but even repeated the botching and patching
" of the pattern, why in that case there will be no difficulty in satisfy-
" ing your pitiful ambition. If, on the contrary,—and which I would
" gladly hope is the case with all—you desire to become worthy
" members of the literary world,—this can only be accomplished by
" resolution, perseverance, and industry—by usefully employing every
" hour you can spare from necessary employment—and every one has
" abundance of time, however early or late he may be engaged, if the
" will exists for the acquisition of knowledge.

" Franklin's example is well worth attention. His success in life
" was secured by his great industry, frugality, and shrewdness. He
" spent no time in taverns, games, or frolics, reading was the only
" amusement he allowed himself. If you properly employ those loose
" moments which occur to every one, and use them in improving your
" minds, you raise yourselves *one step* above your fellows, and acquire
" information which may contribute essentially to your future pros-
" perity and advantage."

Benjamin Franklin, referred to in one of the paragraphs just quoted, was once a journeyman printer. He was apprenticed and learned the trade in America, but laboured as a journeyman for some time in London; afterwards he returned to America and commenced business on his own account; he became proprietor of a newspaper, and when the United Provinces revolted had the appointment of Deputy Post Master General bestowed on him. Whilst the war was progressing he was appointed agent at the court of London for the province of Massachusetts. There are many other examples, besides that of Franklin, of Printers who have risen to distinction by great industry coupled with that tone of knowledge which should peculiarly belong to their art. John M'Creary, was Apprenticed as a pressman, and although when young very poor, by dint of industry and an invincible determination, became a master printer, and amassed a sum sufficient to enable him to retire from business, and enjoy peace and plenty in his old age. Before he was out of his time he wrote a poem called

"The Press," descriptive of the discovery, advantages, and influence of printing.

A Compositor stands in the best situation for obtaining a perfect acquaintance with the details and general management of the Printing business, and from this class, therefore, have proceeded most of those who have reached higher employments, as readers, overseers, Masters, or authors. William Strachan, who became the wealthy kings' printer, entered London a poor journeyman. John Nichols, was apprenticed to Mr. Bowyer, to whom he rendered himself so useful that even while an apprentice he became his assistant, and afterwards partner. David Henry, for some time printer and part proprietor of the Gentleman's Magazine, was a journeyman till he was nearly thirty years of age. John Patterson, a journeyman printer in Albany, has gathered an immense amount of learning. He is well versed in mathematics, and can read and write Greek, Latin, Hebrew, and Arabic, with ease and fluency. Besides this he can converse in every language spoken in Europe. All this he has done with no aid but industry and no higher salary than that bestowed upon a journeyman printer.

Let all who learn our art look at these examples. *All* cannot become great men, but all *may try;* and what one man can do, cannot be altogether impossible to another under the same circumstances.

Ascending letters.—Letters which are above the line, including all capitals, and lower case b, d, f, h, k, l.

Asterisk.—A small star, which is generally used to direct the reader's attention to some note in the margin or at the foot of the page. Two or three asterisks, thus, N * * *, denote the omission of some letters in a word; a line, thus,

*   *   *   *   *   *   *   *

that a sentence or sentences is omitted, or that there is a defect in the MS.

Author's proof.—A clean proof pulled and sent to the author or editor of a work, for him to certify correctness, or make such alterations and emendations as he may think proper.

B.

Back boxes.—Those boxes in an italic upper case, which in the Roman are occupied by small capitals.

Back of the form.—The under side, or bottom of the types.

Back.—Furniture placed between the pages in a form, the margins of which, when bound, form the back of the book. It is sometimes called the gutter.

Bank.—A light table, about three feet high, placed near the foot of the press, upon which the pressman lays his heap. It should have a drawer in front, in which to keep points, revises, thin paper, &c., which otherwise must be on the platten or loose on the table.

Baranowski's Ticket Machine.--This is a beautiful little machine, about twelve inches long, nine wide, and eight high, and very complex in its mechanism.

The types are arranged on the circumference of small wheels, placed vertically; and on turning an handle, which presses down the frame which contains the wheels, by a sort of piston, or plug, the types come in contact with paper or paste board placed beneath; but before doing so, the movement causes a small inking roller to work quickly over the face of the types, and thus enables them to print in black or any other colored ink. By means of a series of cogs and ratchets some of the type wheels make part of a revolution after each impression, so as to present a new figure for the next movement. A number of blank cards are placed in the upper part of the machine, and every time the handle is turned one of them is displaced, printed on, and pushed out of the machine. 3,000 cards can be printed in an hour.

Baskerville Machine.—A single cylinder gripper machine, very useful and easily worked.

Batter.—To injure the face of the letter in any way.

Beard of the letter.—The edge of the square shoulder of the shank, usually bevelled off by type-founders.

Bearer.—A piece of reglet, or other material, used to bear the impression off a blank or light page. Corks cut to fit on the frisket between the folios, by the sides of rules, short pages, or light matter, form excellent bearers, and are very useful to prevent slurring, or a too heavy impression.

Bed of the frame.—The platform at the bottom.

Bill.—With letter-founders, a specific proportionate number of letters, or types. The following estimate is for the lower case of a fount of Pica, weighing 800 lbs.

a	8,500	o	8,000	ﬂ	200	ú	100	:	600
b	1,600	p	1,700	ﬃ	150	â	200	.	2,000
c	3,000	q	500	ﬄ	100	ê	200	-	1,000
d	4,400	r	6,200	æ	100	î	100	?	200
e	12,000	s	8,000	œ	50	ô	100	!	150
f	2,500	t	9,000	à	100	û	100	'	700
g	1,700	u	3,400	è	250	ä	100	Thick spaces	18,000
h	6,400	v	1,200	ì	100	ë	100	Middle ,,	12,000
i	8,000	w	2,000	ò	100	ï	100	Thin ,,	8,000
j	400	x	400	ù	100	ö	100	Hair ,,	3,000
k	800	y	2,000	á	200	ü	100	m quadrats,	2,500
l	4,000	z	200	é	100	ç	100	n ,,	5,000
m	3,000	ﬁ	500	í	100	,	4,500		
n	8,000	ﬀ	400	ó	100	;	800		

Capitals, figures, em and en quadrats, and 2, 3, and 4 em quadrats should be cast to suit the work for which the type is intended.

Founts of any other weight may be calculated on these proportions.

Binding.—When the side or footsticks, or any part of the furniture is too long, and overlaps another part, so as to prevent the quoins wedging the matter tight, it is termed *binding.*

Bite.—When the frisket is not properly cut away, so that a part of the edge of the page, or the folio, does not appear on the paper.

Blankets.—Woollen cloth or white baize used to place between the tympans, to make a yielding pad.

Blank lines. *See* White lines.

Blank pages.—Pages in which no matter appears.

Board-rack.—A case made of strong boards, with ledges nailed on the inside of the two sides, to slide letter-boards in: they are used for

keeping standing pages and jobs more out of the way than can be done on galleys, and where more care can be taken of them.

Bodkin.—A sharp steel instrument, used to pick wrong letters out of a page in correcting.

Body.—The shank of the letter. The size of the type from back to front—thus, English body—Pica body.

Body of a work.—The subject matter of any volume.

Bolster.—A piece of wood placed between the ribs of a press, to prevent the table running out too far, and to ease the sudden strain which would be otherwise caused on the girthing.

Bolts.—The furniture which forms the margin at the heads of the pages in the off-cut in a form of twelves.

Botched.—Work badly finished, or in which improper materials are used.

Bottom line.—The last line in a page.

Bourgeois.—The name of a type a size smaller than Long Primer. There are 102 lines in a foot.

Box.—The divisions of a case in which the letters are kept, as the *a* box, *i* box, &c.

Boxwood.—A firm, fine grained wood, much used for engraving. The best is of a clear yellow colour, and is procured from the Levant. It is generally called Turkey box.

Brace.—A character cast thus ⏞, used to prevent a repetition in writing or printing, or to connect a number of words with one common term.

Branching out.—Opening or extending the matter in title pages, headings, or jobs.—(*See* Whiting out.)

Brass Rule.—Pieces of brass, of different thicknesses, type high, and used to print lines between columns of figures or matter, in tabular pages; to place round pages as an ornament, between the columns of newspapers, and for many other purposes.

Brayer.—A round wooden rubber, about 2½ inches in diameter, of the shape of an inverted cone, solid, and flat at the bottom. It is used to bray, or rub out ink on the table, to be taken up by the roller.

Break.—A short line; the end of a paragraph.

Brevier.—The name of a type, a size larger than Minion, and smaller than Bourgeois. There are 112½ lines to a foot.

Bring-up.—To bring up a form is to place overlays on those parts

in which the impression is deficient, and to cut away those portions in which it is too heavy, so as to equalize the pressure and colour over the whole form.

Broad.—The technical name for a piece of furniture, equal in width to a broad quotation ; i. e., four ems pica.

Broadside.—A form of one full page, printed on one side of a sheet of paper. Broadsides vary in size from a sheet of crown to double royal. Of late years broadsides have been struck on as many as thirty sheets of double crown. In such cases the lines are so arranged as to form one large sheet when pasted against a wall or the side of a house. The size in most common use is demy.

Broken letters.—Type squabbled or deranged. Pages put in pie.

Broken matter.—Same as above.

Bronze.—Metallic powders, of various colours, much used in ornamental printing. The lines which are to be bronzed are printed with a peculiar varnish, and the powder is immediately applied with a little loose cotton. When dry the superfluous dust may be rubbed off with a hare's foot or a camel-hair pencil. For very fine work the bronze should be burnished, either by running through a glazing press, or rubbing with a burnishing tooth.

Bulk.—A platform fixed to the end of a frame, on which to place a board to wet matter for distribution.

Bundle.—A heap of paper of two perfect reams, or 1,000 sheets.

Burr.—A roughness on types which the founder has not removed in dressing.

C.

Cancel.—To strike out pages in which errors have passed, or which the author, after printing, does not wish to appear. When a leaf is cancelled it should be torn across, so that the binder may see it and turn it out. In reprinting pages which have been cancelled, it is usual to place an asterisk in lieu of the signature, that the binder may know for what the pages are intended.

Canon.—A type, one size larger than Trafalgar, the body is equal to four lines of Pica, and there are 18½ lines to the foot.

Capitals.—Letters of a form different from lower case. For their use, *see* head " Punctuation."

1 o/ The prøcess of printing, when compared with that of
writing, is unquestionably a ~~dear~~ process; provided a 2 cheap
3 copies of sufficient number of ‸ any particular bookare printed, so 4 #
5 9 as to renper the pro portion of the first expense upon a 6 ◡
7 ꝺ/ singgle copy inconsiderable. If, for example, it were
required, even at the present ~~moment~~ time, to print a 8 ꝺ/
single copy, or even three copies or four, only of any 9 tr
production, the cost of printing would be greater than
10 run on the cost of transcribing.

It is when hundreds. and especially thousands, of the 11 ,/
same work are demanded that the great value of the
12 tr/ printing press in maknig knowledge cheap, is par-
ticularly shown. [It is probable that the first printers 13 N.P.
did not take off more than two or three hundred, if so
14 ;/ many, of their works ‸ and, therefore, the earliest printed
books must have been still dear, on account of the
15 italic/ limited number of their readers. CAXTON, as it appears 16 l.c.
by a passage in one of his books, was a ~~cautious~~ printer; 17 stet/
and required something like an assurance that he should 18 wf/
sell enough of any particular book to repay the cost of
19 ⊙/ producing it ‸ In his 'Legends of Saints,' he says, "I 20 s. caps.
have submysed (submitted) myself to translate into
21 ‘/ . English the ‸ Saints of Legend,' called 'Legenda aurea' 22 tr/
23 caps/ in Latin; and William, Earl of Arundel, ‸ sent me a 24 desired me—and promised to take a reasonable quantity of them—and
worshipful gentleman, promising that my said lord
should, during my life, give and grant to me a yearly fee, 26 ×
that is to note, a buck in summer and a doe in winter ‸ 27 ‘’/

1. Is the mark for changing the wrong letter in the word process.
2. To substitute one word for another.
3. and 24. The first is the method of marking a short insertion, the second of marking a long one.
4. To have a blank space put between the two words.
5. To turn a letter which has been placed upside down.
6. To close the word in which a space has been improperly left.
7. and 8. To take away (*dele*, blot out) a superfluous letter or word.
9. 12. and 22. Different marks for transposing the arrangement of letters, words, or sentences.
10. To have no fresh paragraph.
11. To substitute a comma for a full-point or period.
13. To commence a new paragraph.
14. 19. 21. and 27. To insert points and marks of quotation.
15. To have any particular part printed in Italic.
16. To have words or letters printed in 'lower case,' or small letters; Roman is always understood, unless otherwise directed.
17. To have a word remain, which has been accidentally or erroneously marked. *Stet* is the Latin for "let it stand."
18. Points out a letter which does not match with the others; a 'wrong fount.'
20. and 23. To have certain parts printed in small or full capitals.
25. To set straight whatever may stand crooked.
26. To remove the unnecessary black mark between the words, which arises from what should form the space not having been pushed down.

Card.—A peculiar thick paper, used for various purposes, but particularly for Names and Addresses of persons, and to describe the calling of trades-people.

Caret.—A mark (ʌ) used to denote that words are to be inserted.

Carriage.—That part of the press which runs in under the platen.

Case.—A frame, or set of boxes in which letter is kept to compose with. Cases are always spoken of as pairs, *viz.*, the Upper Case, in which capitals, small capitals, figures, and accents are kept, and the Lower Case, used for the small letters, points, spaces, and quadrats. In England they are made of beech, but in this country teakwood is most used. Cases should always be lined with paper, or they will be likely to damage the face of types at the bottoms of the boxes.

Case-rack.—A strong frame, with ledges, in which to slide cases that are not in use, to keep them safely.

Cassie paper.—Damaged paper, the outside quires in a ream.

Cast up.—To calculate the number of types in a page, form, or sheet, and their value for work done at so much per thousand letters. The following is the method of proceeding.

Measure the length of the page, including head line, with em quadrats, and the breadth with en quadrats of the font in which the matter is set; multiply them together, and the product will be the number of letters in a page. This multiplied by the number of pages in a sheet, will give the total number of letters contained in it, and the thousands being multiplied by the price paid per 1,000, will give the total value of the sheet or half sheet to the compositor, who is paid for work done. Thus a page of Proceedings of Government is 67 ems long and 82 ems wide :—then

$67 \times 82 = 5{,}494 \times 4$ pages ($\frac{1}{2}$ sheet) $= 21{,}976$, or say 22,000 letters in a half sheet. 22,000 @ 2 annas per thousand = Rupees 2-12-0.

In casting up it is usual if the number of types over a thousand amount to less than 500 to strike them off; and if they amount to 500 or more to reckon them as a thousand. Thus 21,459 is called 21,000 only; but 21,559 is called 22,000.

Cast off.—To examine MS. copy, and determine how many pages it will make in any given size and type. This is done by composing five or six lines selected from some part which seems to be of the average style of writing, and thus ascertaining how many lines of MS. will make even lines of print. Suppose there are six hundred pages of MS., averaging thirty lines in a page, and that it is required to know how many pages of foolscap folio it will occupy in print. There are

altogether 18,000 lines of MS.; nine lines of MS. make five of print, therefore there will be 10,000 lines of print, which at 53 lines to a page will make 189 pages. Sometimes it is necessary to cast off reprint copy, to determine what quantity will be got in, or driven out, by setting in larger or smaller type.

Catch-word.—The first word of the following page, placed at the right-hand corner at the foot of the page. Catch-words are seldom used in modern times, except in law papers or MSS.

Cater-cornered.—A term applied to uneven paper, or paper whose sides are not right angles with each other.

Caxton Press.—A single cylinder, gripper machine, in which the rollers are loose and are inked from a table affixed to the carriage of the press. The ink-table travels with the carriage, so that form and table pass under the rollers alternately. It is of very simple construction and easily worked.

Ceriphs.—The fine lines at the bottoms and cross strokes of letters.

Chase.—An iron frame in which pages are securely fastened to print from. They are made of the following sizes:

Double Royal, 4to., 8vo., 12mo., 18mo.
Double Demy, 4to., 8vo., 12mo., 18mo.
Double Crown, 4to., 8vo., 12mo.
,, Foolscap, 4to., 8vo.
Super-Royal, 4to., 8vo., 12mo., 18mo.
Royal, 4to., 8vo., 12mo., 18mo.
Demy folio, 4to., 8vo., 12mo.
Crown folio, 4to., 8vo.
Foolscap folio, 4to.
Besides these are Heading, Job, Card, Broadside (according to size of paper,) and News Chases.

Choked.—Type filled up with dirt, or the sediment of ink, so that it does not work clear, is said to be choked.

The term is also used when too much ink has been spread on the form.

Clarendon.—A lighter kind of Antique letter, much used for Job work.

Clean Proof.—A proof with but few faults in it. A proof pulled carefully after correction, to send to the author, or to read for press, is also called a clean proof.

Clearing away.—Taking out leads, white lines, and smaller type from the body of a work after printing, so that the type may be papered up and put away.

Clearing Pie.—Separating various sizes, or kinds of types from a confused mass, and placing each letter in its proper box and case.

Clicker.—The compositor who, in a companionship, receives the copy and gives it out to compose, and attends to the correct making up and printing. A clicker, in England, occupies the same post, and has the same responsibilities as the foreman of a department in India. (*See* Companionship.)

Close matter.—Pages with few breaks or whites, or without leads between the lines.

Close spacing.—Putting as little space as possible between words.

Cogger's Press.—A powerful press, excellent for fine work, but little used now, as it is very apt to get out of repair.

Collate.—To examine the signatures in each gathering of a book, to see that they are consecutive.

Columbian Press.—A press invented by Mr. George Clymer, of Philadelphia. The first press of this kind constructed in London was put up in 1818, and afterwards sent to Russia. It is an iron press, without a screw. The head is a powerful lever, acted on by other levers, to which the bar is attached and produces the pressure. The platen is attached to the head by a strong iron bar, and the descent is made steady and regular by two iron guides which project from the cheeks. The power of this press is very great, and from the simplicity of its construction it is best suited to the unskilled labour of this country.

Column Galley.—A long narrow galley, used for newspaper work.

Companionship.—A number of men employed together upon a work or works, under a head man chosen by themselves, and called a clicker. It is a system peculiarly adapted to piece work. When a companionship is formed, the members draw lots, to decide upon which works they shall be employed in the first instance, and the clicker gives them copy accordingly. The number of lines containing a thousand letters are calculated for the various works, and that number is called "an hour;" the workmen keeping all their accounts in "hours." While the compositors are setting up the first matter the clicker gets his furniture ready, sets up any blanks that may be required, and, as far as he can, sets the notes. As soon as sufficient matter is out, he makes up and imposes. At the end of the week the clicker makes out the bill for the work done by the whole companionship. When he has found the total value, he divides it over the whole number of "hours" done by the men, and each man has his labour exactly paid for, the best men, or the most diligent, getting the highest pay, from having done the greatest number of hours' work.

Composing.—Placing the types in their proper order in the composing stick, and spacing the words so as to make even lines.

When composing, the stick is held in the left hand, with the thumb touching the setting rule. The copy should be placed on the ridge of the upper case, so as to be directly before the eyes of the compositor, who looks, quickly, but carefully, at his copy, striving to remember, if he can do so correctly, nearly or quite a line at a time. He then begins picking up the types in their proper order, carefully watching his case to see which way the type he is about to lift lies in it, so that he may turn it when necessary, as he moves his hand rapidly to the stick, without losing time in looking at and turning it after it is lifted. The left hand with the composing stick, should always follow the right, which picks up the letters. If the left hand remains stationary, much time is lost in carrying each letter to the stick, because the right has, consequently, to traverse a much greater space than is necessary.

When words sufficient to form a line have been set, the compositor proceeds to space out, glancing over the lines while spacing out to see that there are no errors in them. Having spaced his line (*see* spacing) moderately tight, he shifts his setting rule, reads a new sentence of his copy, and commences a fresh line. When lines sufficient to fill the stick have been set up, they are emptied on to a galley placed ready on a case by his side, and he commences a fresh stickful. Regularity of spacing contributes in a material degree to the appearance of a book, and great care should be taken to obtain this regularity. There is a great diversity of opinion regarding spacing; some printers choosing to have the words wide apart, while others have them close; but both of these systems are faulty. Thick spaces where possible, with as little more or less as can be done with, gives far the best appearance to any book, and the least trouble to the compositor. When a work is double leaded a wider space is necessary, and an en quadrat may be the standard.

Much valuable time is lost by reading and correcting matter when the stick is full, or emptied in the galley. If each line is read while being spaced out, this will not be necessary, and it is much less trouble to correct any literal error while the types are loose, or to insert a word or letter which may have been left out, than it is when the lines are tight in the stick.

When matter is leaded, the lead should be placed in the stick immediately the line is finished, before shifting the setting rule. If

this is not done, but the leads inserted in the galley or on the imposing stone, they not only take at least thrice the time to insert, but push the matter off its feet, and so cause the type to wear rapidly by having all the impression on one edge. Letters are often knocked down, errors caused, and a fresh examination rendered necessary by this foolish system.

The mere picking up of letters, and arranging them in the composing stick, is looked upon by many who call themselves compositors as constituting the whole of their business. Never was a greater mistake. Picking up types quickly is but a mechanical operation. A good compositor should be able to set solid matter or statements, reprint or manuscript equally well. He should be able to display a title or broadside, as well as compose for a newspaper; and should be competent to make up, impose, and correct his matter without any other assistance than that of the reader. He should have an eye for symmetry of form, or he will not display work neatly. He should be of orderly and attentive habits; have a strong desire to excel; a love of reading and study; a grammatical knowledge of the language on which he is employed, and be able to punctuate his matter as he composes, such a man will be a "good compositor," and need never fear want of employment.

The following extract from "Savage's Dictionary of Printing," although written in England, will apply to printers in any part of the globe. The author has been speaking of a bad workman, and goes on to say

"How different is the case with the man who is anxious to deserve "the character of a good workman. In his youth he has been desir-"ous to acquire expedition, and having attained it, he has felt that "other requisites were necessary. He has read, to obtain informa-"tion; he has examined the best workmanship, as specimens for his "guidance; he endeavours to compose accurately; he is careful and "uniform in his spacing; he divides words correctly, and with a "regard to appearance; and when occasional bits of rule work occur, "they are marked by a degree of neatness in being cut to precise "lengths, and in the corners fitting with precision; in all the work "that passes through his hands there appear the marks of attention "and skill.

"When a master printer undertakes a work which requires more than "ordinary care, and is difficult to execute, the superiority of the man "who has endeavoured to improve himself is evident: he is selected

" to perform it ; and he then feels the advantage of his perseverance. " At work upon a difficult subject, with an ill written manuscript, " his first proofs show him equal to the task. His arrangements of " the matter are judicious, his punctuation is correct; when particu- " lar sorts are to be justified, they are done with accuracy ; and when " his proof returns from the reader he will frequently correct it in as " little time as a slovenly compositor will require to correct a proof of " a similar size that is a reprint.

" The good workman is prized by his employer, especially if the " latter be a workman himself, and is a man of judgment. He is " looked up to by his fellow workmen ; his situation is permanent, if " he choose ; his abilities qualify him to be a reader, and if his mind " lead him that way, he may obtain such a situation. His knowledge " and his merit fit him to become the overseer (Superintendent) of a " large house, where he has many advantages, and where he continues " with credit to himself, unless, perhaps, he chooses to commence " business on his own account, when he invariably obtains the coun- " tenance and support of those who have witnessed his skill, his " knowledge, his attention, and his industry."

Composing Machines.—Several persons have spent many years of their lives in endeavouring to invent machinery to do the work of the compositor ; but all have failed in a greater or lesser degree. They have facilitated the mere act of putting types together, beyond that they have not gone (unless the new American machine may prove a success but this I have not yet seen), some of these machines are ingenious pieces of mechanism, and compose types rapidly, by the aid of one or more persons; yet they are not employed by printers, because it is found impossible to make a machine capable of thought, and thought is necessary in justifying, making up, and correcting.

In 1842 much attention was attracted by two rival machines. The first of these was the invention of Messrs. Young and Delcambre. To work it the compositor sat before a keyboard and pressed his fingers on the keys of his silent piano instead of picking letters out of little boxes. The key touched moved a lever ; the lever pushed a type out of a little receptacle; the type slid down an inclined plane into a box, from which the compositor took the lines as they were composed, and justified them in his composing stick.

Captain Rosenberg's machine had the same piano-forte arrangement of keys, and was played upon in the same manner. But, instead of moving a lever, the key itself detached a type from a vertical rack ;

the types, when detached, ranged themselves on an endless belt, and leaving the belt entered a close receiver. When a complete line was formed the machine gave a stroke on a bell to warn the compositor to take it away.

This machine had a distributor attached, and was therefore more complete than the former, but so many attendants were required that it was not found to pay.

M. "Sorenson," a Native of Denmark, was the inventor of the next. His was a singular machine, much like a bird-cage. Two circular cases were placed one over the other, the upper being capable of revolving on its axis independant of the lower. The upper case was for distributing; the lower case for composing. To distribute, the compositor took up a few types, and placed them between the brass bars of the cage, from whence they slid down to a plate separating the two. This latter was perforated in such a manner that only one kind of letter would pass through each perforation, every letter being nicked, or notched, differently; as the upper case revolved, the types discovered the perforation through which alone they could creep into the lower cage. The cage had as many vertical brass bars as there are letters, and by degrees the space within the bars became filled with types of all one letter; this ended the distribution. In this machine also the compositor played on a set of keys, which acted upon strings; the strings in their turn acted upon springs; the springs pushed out the requisite letters from between the bars of the cage; the types descended to a sloping plate, then through a spiral tube, then into a receiver, where they arranged themselves side by side. A foot pedal moved the receiver gently along as the types dropped into it, and when a line was completed the compositor took it away to justify, and adjusted the receiver for another.

The next, Mitchell's Type-setting Machine is now in operation in America; and is said to do the work of five men. It is of a triangular shape, somewhat resembling a grand piano, but not so large. It has a key board corresponding to the letters of the alphabet and the points, and the keys are touched for the required letter, precisely in the same manner as the piano is played. The letters are supplied by long galleys, each filled with a single letter, which require constant replenishing. Every touch upon a key sends a letter into a long line beneath the machine, and from here it is taken by a compositor, who breaks it into lines to suit the width of the page or column, and justifies it. The distribution is also managed easily.

The last invention is the fruit of a long life of labour, and when completed the inventor, Timothy Alden, of Massachusetts, was so worn out that he lived but a short time. It is, like those before described, "played" like a piano, but the types are carried to their proper place by a revolving table of brass. This machine will also distribute as rapidly as it composes, a desideratum which has not been reached by any other. The inventor calculated it to do the work of eight men.

Composing-rule.—A piece of brass rule, cut to a certain length, to lay in the composing stick and arrange the letters upon. Its use is to allow the types to slide swiftly and smoothly into their places when composing, and to prevent lines breaking, which would otherwise often happen, from the bottom of one letter catching in the nick of another.

Composing-stick.—An instrument in which letters are arranged in words and lines. In England sticks are commonly made of iron, though sometimes of bell metal. In this country they are made of brass, iron being found to oxydise too rapidly.

Compositor.—A person who composes, or sets up type for printing.

Cope's Press.—The Albion, invented by Richard Cope.

Copper-plate Press.—A press used to print from engravings on copper or steel. The mechanism is exceedingly simple. It consists of two steel cylinders, or rollers, supported in a strong frame. These rollers are moveable on their axes, one being placed just above, the other just below, the level of the table on which the plate to be printed is placed. The upper cylinder is turned round by the arms of a cross fixed on its axis, or by some more powerful leverage; the lower cylinder is turned by the action of the upper on its surface. These rollers are so constructed as to admit of a greater or less amount of pressure being put on them.

Formerly there were longitudinal slits in the framing of the Press, in which pieces of cardboard were inserted as required; but modern improvement has substituted screws, by which the axle of the upper cylinder can be elevated or depressed at pleasure.

Copper-plate Printing differs materially from ordinary Letter-press Printing, and is a far more tedious employment. The printer to whom a copper plate is confided for printing, first places it in a sort of box, the top of which consists of a plate of sheet-iron, in which is placed a pan filled with lighted charcoal dust. When it has attained a certain degree of heat, he removes it from the box, and covers

it as equally as possible, by means of a dauber, or dabber, with a light layer of copper-plate ink. Inking the plate is an operation requiring great care and no small degree of skill, as, if either too much or too little ink be employed, the impression will be spoiled. The kind of ink used is technically called "black," and is composed of very thick boiled oil, mixed with a proper quantity of Frankfort charcoal (made from vine twigs). This black being slightly liquified by the warm plate, enters the most superficial lines or scratches. A piece of coarse muslin is then taken, and by rubbing it on the plate the black is made to enter all the lines, while the superfluous ink is removed from the surface, which is polished bright by similar means. The printer lastly wipes off whatever black remains on the surface of the plate with the palm of his hand. This is a very delicate, though not a very clean operation ; a good workman leaving all the lines well filled with ink, while the parts which are intended to appear white in the impression, are made bright and smooth, by the manipulation of his hand, assisted by a little whiting.

The engraving is now placed on a mahogany or walnut wood board, a sheet of damp paper laid on the plate, and four or five blankets (the texture of which is stouter than cloth and not so loose as flannel,) over the paper, and the whole, board, plate, paper, and blankets, passed between the rollers of the press. The blankets may be fixed to the upper cylinder, as in a printing machine. The workman, taking one of the arms of the cross in his hands, places his foot against the frame of the press, and by dint of sheer bodily exertion forces the whole through the cylinders, and thus produces the impression required. The philosophy of the process is simply that pressure on the elasticity of the cloth forces the moist paper to enter the lines in the plate, and take up all the black ink from it.

Copy.—Manuscript to be printed, or printed matter to be reprinted.

Correct.—To rectify such faults, omissions, or repetitions, as may be made by the compositor through inadvertence or carelessness. The term corrections is sometimes applied to the alterations made by authors; but these would be more properly styled emendations.

Correcting is the most disagreeable part of a compositor's business, is very fatiguing, from the posture assumed, and is prejudicial to health. A knowledge of this fact should make every compositor careful at his case, that he may avoid spending his time at the stone or imposing table. As soon as the proof is given out, the compositor should lay up his form (unless it is a galley proof) and unlock it all round, being

careful not to leave the quoins too loose, or the matter may be squabbled, or types fall at the ends of the lines. He should then gather as many corrections between the thumb and forefinger of his left hand as he can conveniently hold, with a few spaces on a piece of paper, or what is more convenient, in a small box, with partitions in it. Taking his bodkin in his right hand the corrector should place the point of it against the end of the line he wishes to correct, and with the middle finger of his left hand against the other end of the line, raise it altogether, high enough to give him a clear view of the spacing; he can then change the faulty letter, and make the necessary alterations in the spacing, before dropping the line. By this method the type will not be injured, as it so often is when the bodkin is forced into the sides or heads, regularity in the spacing may be secured and much time will be saved.

Hair.	Thin.	Thick.
Em.	En.	Quads.

In tables, or in any matter in which rules prevent the matter being raised as directed, the letters must be drawn out by the bodkin, and great care will be necessary to avoid injuring the types. The point should be stuck into the neck of the letter, between the beard and the face, drawing it just high enough above the other letters to allow of taking hold of it with the forefinger and thumb of the left hand. In this operation as small an angle as possible should be made with the blade of the bodkin, that it should not touch any of the surrounding types, as a trifling graze will injure the face.

In the event of a word or words being left out, the Compositor should examine the lines above and below the error, to see how it can be best got in, this ascertained, the matter should be taken on a galley and overrun in the composing stick; for doing such work on the stone is unworkmanlike, unsafe, and dilatory, destroys the justification and renders the spacing uneven. Lines must not be hair-spaced in correcting to save the Compositor trouble, as it spoils the appearance of any work, but should be overrun, either before or after the correction, to avoid it. Directly the last page in the sheet is corrected, a clean proof must be pulled for the reader to revise, and if all the corrections have been made, the form may either be sent to Press, or the proof forwarded to the author.

Corrections.—The alterations marked in a proof; the letters gathered to correct with, or wrong types taken from a form. The specimen opposite shows the manner of marking them.

Cramped.—Work is said to be cramped when whites are used spar-

ingly, short pages avoided, and matter spaced closer than usual, to get a certain quantity of matter into a certain number of pages. A compositor cramps his matter when he does not insert whites in proportion to the open character of his work, or to the size of the letter.

Cross.—The long and short crosses of a chase are bars of iron, crossing each other at right angles and dovetailed into the rim of the chase, dividing it into four parts. The short cross is the broadest, and has a groove cut for the points to fall in.

Crotchets.—Or brackets, [ ], are used to enclose a word or sentence intended to supply some deficiency, or to rectify a mistake.

Curvilinear Furniture.—Pieces of metal by the aid of which lines of type may be bent in various shapes, so as to imitate engraved cards or headings.

Cut-in Notes.—Side notes, inserted in the text, the lines of which are shortened to admit them.

D.

Dagger, or Obelisk.—A mark, thus †, used as a reference, it is second in order after the asterisk, or star.

Dash.—A mark, thus ——. Dashes, or metal rules, are made of various lengths, from one em to four ems, and are used in punctuation, for cross lines in statements, to fill up names which are not printed in full, and for other similar purposes.

Dele.—The second person singular, imperative mood, of the latin verb *deleo*, to blot out. It is a word much used in a printing Office, and is denoted by this mark (δ) in proofs, where it may be necessary to expunge a letter, word, or words.

Desideratum.—A cylinder machine manufactured by Messrs. Hopkinson and Cope. The sheet is carried round the cylinder by grippers, or metal fingers, which close on the sheet by means of a spring set free on reaching the laying-on board. When the impression is complete the grippers unclose, and allow the sheet to be removed. The inking apparatus is simple and easily kept clear. About 800 impressions per hour is the average speed.

Diamond.—The name of a type, a size smaller than Pearl. There are 205 lines to a foot.

Direction.—A word placed at the bottom of a page in the right hand, to show the connexion with the page following. Directions are now only used in law papers.

Distribute.—To replace the types in their respective boxes in the cases, after printing therewith, in order to their being used again. This work is done very rapidly by the compositor, who, placing his rule against the head of a page, takes up what is termed a handful, and keeping the face of the letter towards him, rests one end of the composing rule against the ball of the thumb of the left hand, and pressing the other end of the rule with the third finger, steadies the matter with his forefinger, and thus has the right hand at liberty, with which he takes a word or part of a word from the uppermost line, and drops the several letters into their respective boxes. It is usual to wet matter before distribution, so as to render it slightly cohesive, the operation being performed with more facility than when dry. Only so much matter should be taken up at one time as can conveniently be held in the left hand; as too much tires the wrist, and is in danger of falling. The Compositor should be careful not to throw letters into the case with the face downwards, as it is apt to batter them ; neither should he distribute his case too full, as it creates pie. He should not care so much for distributing quickly, as correctly—expedition will come with practice—as much time is lost in composing from a dirty case. Many lose time in looking at the word in their fingers before distributing it : by proper attention this may be avoided, and the workmen become an expeditious as well as clean distributor. To attain this, I advise the learner never to take more letters between his fingers than he can conveniently hold; if possible, always to take an entire word, and to keep the left hand slightly inclined, so that the face of the letter may come immediately under his eye. By practice, he will become so well acquainted with the appearance of the beard of the type, that he will be able to know what word he has in his fingers, with the very cursory view he may have while lifting it. By attending to these directions—by always proceeding on system,—clean distribution may be depended on ; and clean distribution produces clean composition. What greater disgrace can attach to a compositor, than being denominated a foul or slovenly workmen ? To avoid this stigma should be his earnest endeavour; and one great means to avoid it is to be careful while distributing.

Division.—In printing, is the separation of the syllables of a word, the first part at the end of one line, the second part at the beginning

of the next, to avoid driving out or getting in the whole word. There are peculiarities in dividing in most offices, but the following rules, from Lindly Murray, will generally apply.

" 1. A single consonant between two vowels must be joined to the latter syllable: as, de-light, bri-dal, re-source: except the letter x; as, ex-ist, ex-amine: and except likewise words compounded; as up-on, un-even, dis-ease.

" 2. Two consonants proper to begin a word, must not be separated; as fa-ble, sti-fle. But when they come between two vowels, and are such as cannot begin a word, they must be divided; as, ut-most, un-der, in-sect, er-ror, cof-fin.

" 3. When three consonants meet in the middle of a word, if they can begin a word, and the preceding vowel be pronounced long, they are not to be separated; as, de-throne, de-stroy. But when the vowel of the preceding syllable is pronounced short, one of the consonants always belongs to that syllable; as, dis-tract, dis-prove, dis-train.

" 4. When three or four consonants, which are not proper to begin a word, meet between two vowels, the first consonant is always kept with the first syllable in the division: as, ab-stain, com-plete, em-broil, dan-dler, dap-ple, con-strain.

" 5. Two vowels not being a diphthong, must be divided into separate syllables; as, cru-el, deni-al, soci-ety.

" A diphthong immediately preceding a vowel, is to be separated from it: as, roy-al, pow-er, jew-el.

" 6. Compounded words must be traced into the simple words of which they are composed; as, ice-house, glow-worm, over-power, neverthe-less.

" 7. Grammatical, and other particular terminations, are generally separated: as, teach-est, teach-eth, teach-ing, teach-er, contend-est, great-er, wretch-ed, good-ness, free-dom, false-hood.

" Two consonants which form but one sound, are never separated: as, e-cho, fa-ther, pro-phet, an-chor, bi-shop. They are to be considered as a single letter.

" 8. In derivative words, the additional syllables are separated: as, sweet-er, sweet-est, sweet-ly; learn-ed, learn-eth, learn-ing; dis-like, mis-lead, un-even; called, roll-er, dress-ing; gold-en, bolt-ed, believ-er, pleas-ing.

" Exceptions.—When the derivative word doubles the single letter

of the primitive, one of those letters is joined to the termination: as beg, beg-gar; fat, fat-ter; bid, bid-ding.

" When the additional syllable is preceded by c or g soft, the c or g is added to that syllable: as, of-fences, cotta-ges, pro-noun-cer, in-dul-ging; ra-cer, fa-cing, spi-ced; wa-ger, ra-ging, pla-ced, ran-ger, chan-ging, chan-ged.

" When the preceding single vowel is long, the consonant, if single, is joined to the termination: as, ba-ker, ba-king; ho-ping, bro-ken; po-ker, bo-ny; wri-ter, sla-vish; nau-sea, sa-ved.

The termination *y* is not to be placed alone: as, san-dy, gras-sy; dir-ty, dus-ty; was-ty, fros-ty; hea-dy, woo-dy; ex-cept dough-y, snow-y, string-y, and a few other words. But even in these exceptions, it would be proper to avoid beginning a line with the terminations *y*.

" Some of the preceding rules may be liable to considerable exceptions; and therefore it is said by Dr. Lowth, and others, that the best and easiest directions for dividing the syllables in spelling, is to divide them as they are naturally separated in a right pronunciation, without regard to the derivation of words, or the possible combination of consonants at the beginning of a syllable."

But it is not to be supposed that these divisions are to be made if they can be avoided; and avoided they may be in all works except those in narrow measures, or in large type. Such syllables as ed, al, el, ly, er, &c., should always be got in, except in the two cases just mentioned (the hyphen used to divide the syllables will often occupy as much space as one of the letters); and such syllables as em, en, ab, fa, de, er, &c., should be driven over to the next line. In broad measures divisions may always be avoided, for a very slight additional space between the numerous words will suffice to drive out several letters; or if necessary, to get two or three letters in the thick spaces may be changed for middling with very little trouble.

Double.—Amongst compositors, is a repetition of words, which have to be deleted, or expunged, in the first proof. Amongst pressmen a sheet pulled twice, and thus slurred, or set off.

Double dagger.—A mark used as a reference, ‡; it is third in order, and follows the dagger, or obelisk.

Double letters.—Two letters cast on one shank; as ff, fi, fl, and the dipthongs.

Double narrow.—Furniture, equal in width to two narrow quotations, or six ems pica.

Double Pica.—A type one size smaller than Two-line Pica, and larger than Great Primer. It is equal in depth to two lines of small Pica, there being 41½ lines to the foot. The more proper name for this fount would be Two-line Small Pica.

Double Platten, or Flat-surface Machine. This machine, as its name denotes, gives a flat impression, by a platten similar to that of an ordinary press. There are two tables, or carriages, so that forms can be laid on at either end of the machine. As the carriages traverse backward and forward each form is alternately under the platten, which descends and gives the impression to one form, while the sheet is being laid on for the other. The action of these machines is extremely beautiful; and as they are fitted with friskets and tympans, they may be made to execute the finest presswork. The rate of working is about 1,200 copies per hour.

Draw.—To pull out letters with the roller, while inking the form, in consequence of lines being badly justified, on the form not properly locked up.

Dress a Chase.—To fit the pages with proper furniture and quoins.

Drive out.—To set widely, or use extra space between words; to turn words over at the ends of paragraphs; to make up openly for the sake of extra pages.

Dropping out.—Is generally caused by bad spacing, leads riding, furniture binding, or similar carelessness. When the form is locked up the compositor should raise it slightly from the stone, and shake it a little, to see that nothing is loose before lifting it on the press.

Duck Bill.—A tongue cut in a piece of paper, and pasted on the tympan to support the white paper when working, in lieu of pins.

Duodecimo.—The size of a book, usually written 12mo. It is formed by folding a sheet of paper into twelve portions, or leaves, making 24 pages.

E.

Ear of the Frisket.—A projecting piece of iron on the near side, by taking hold of which the pressman turns down the frisket; as it projects a little beyond the tympan, he also raises the sheet off the form by grasping it and the tympan; and by a quick motion as it rises quits hold of the latter, and turns up the frisket by means of the ear.

Electrography.—A method of producing facsimiles of steel or copper plates. Suppose a large engraving is about to be copied. The plate is immersed (after having the back covered with a peculiar varnish) in a chemical solution of copper, and a thick film is precipitated on it by electro-deposit. The film may be easily loosened from the plate, and its surface then presents a reverse of the original. The film is in its turn immersed in the solution, and made the basis for a second deposition, which is allowed to continue until a plate as thick as the original is deposited, and this when carefully removed from its parent film, is seen to be an exact counterpart of the engraved plate first operated upon.

Empty Case.—A case from which no more matter can be composed, in consequence of some of the sorts being exhausted.

Empty Press.—A press standing idle from want of work.

English.—A type one size smaller than great Primer, and larger than Pica. There are sixty-four lines to a foot.

Engraving.—The art of executing designs upon copper, steel, zinc, or any other material, from which impressions, or "prints," may be taken.

It is usual to speak of the discovery of the Art of Engraving, as contemporaneous with that of Printing. The Chinese certainly practiced it before the tenth century, printing being discovered in China about that time by one Foong-taon, who multiplied copies of a book by means of an engraved seal, or stamp. The early Egyptians and Babylonians produced impressions on bricks from engraved pieces of wood or stone. The ancient Romans possessed engraved seals at a very early period of their history.

It is not necessary to speak farther of the art as known to the ancients, as that has no connexion with printing, and would therefore be out of place in book which is devoted wholly to the last named subject; I will therefore proceed at once to the discovery as applied to taking impressions on paper, silk, parchment, or some similarly flexible material.

The invention seems to have been the result of accident. It is generally ascribed to a Florentine Goldsmith, Tommaso Finniguerra, who excelled in an art then much practised, called Niello-work. It was customary in those times to engrave outlines of Scripture subjects on vessels made for the use of the Church; and when this engraving was completed they filled the lines with a black substance called Niello, composed of lead and silver in solution with borax and

sulphur. Finniguerra, it is said, was one day taking an impression of some of his work, in wax ; and he found, on examining the impression, that he had taken all the Niello which remained in the bottoms of the lines, in such a way that he had the whole pattern in black before him, and it at once struck him that he might also take off his patterns on paper. This first step was followed by a second, and that again by others, and thus the beautiful art was invented.

The first "prints" were obtained from wood blocks, engraved in relief, and the earliest impression known is dated 1423 (*see* Engraving on Wood); but no impression from an engraved metal plate has been found of a date anterior to 1461. Finniguerra is said to have first engraved on metal plates for the purpose of printing about the year 1460; but, as soon as established, the new art was eagerly taken up in Italy by Baldini, Botticelli, Pollajuoli, and Andrea Mantegna ; and in Germany by Martin Schœn, Israel van Mecheln, Leydenwurf, and Wolgemut.

The first book *printed* in Rome, was also *illustrated* by twenty-seven maps, executed by two Germans, Sweynheym and Buckinck. This work is dated 1478. Another early work was published at Florence in 1481, Dante's Inferno, embellished with engravings by Baoccio Baldini, after the designs of Botticelli.

At the commencement of the 16th century, Albert Durer appeared in Germany, a man of vast talent, who carried every description of art to a degree of perfection hitherto unknown in that country. He had great command of the graver, and his plates were finished to a higher degree than those of his Italian contemporaries.

Lucus van Leyden was the father of the Flemish schools, and a friend of Albert Durer. Nearly all the eminent painters in these schools have been engravers.

In France engraving has been practised with pre-eminent success, in the departments of history and portraiture, since the time of Louis XIV.

The English school of engraving dates only from about the middle of the 18th century, previous to which those who practised the art in England were chiefly foreigners.

This art attained great perfection in the 15th and 16th centuries, as is proved by the works of the engravers of that period.

Since that time the old processes have been merely modified ; though

some of the best and most artistic engravers the world has yet produced are now living.

There are several kinds of engraving practised, each effected in a different manner.

Line engraving is the principal as well as most ancient species. Sometimes this is executed entirely with the graver and dry point, finished with the scraper and burnisher; at others it is commenced by a chemical process called "etching." For etching the plate is first cleaned on its polished surface, heated, and then rubbed with a composition of asphalte and Burgundy pitch, called etching ground. The plate is then held up to receive the smoke of a wax taper, until it is rendered black and glossy. These preparations being made, and the plate cooled, the etching ground is found to be of a hard consistence, and ready to receive the tracing of any subject to be etched. The previous preparation of the subject is a very important part of the process. It is drawn upon transparent paper with a black lead pencil, and being laid face downwards on the etching ground, is pressed on it so forcibly that all the lines and marks of the drawing are left on removing the paper. This is called transferring. The drawing being transferred, the engraver applies his etching needle to the lines, carefully removing the ground and scratching slightly into the copper. When any error is made, the objectionable lines may be stopped out by working a little of the ground over them with a hair pencil dipped in turpentine. A wall of wax is now placed round the plate, and aquafortis poured on it, to the depth of an inch. This decomposes, or bites into the copper where the ground has been removed. During the process globules of air arise, and these must be carefully removed with a feather. The length of time employed is regulated by the depth required; but in ordinary cases, the operation may be performed in an hour. When the plate has been properly acted on, the aquafortis is poured off, the wall of wax removed, and the ground cleared from the plate by spirits of turpentine. The plate is now etched, and when printed from in this state exhibits the appearance of a pen and ink sketch. Different gradations of power are given by the aquafortis, and parts are re-bitten to the depth required, after which the light parts are put in with a needle. Other parts are cut with gravers suited to the lines which will best express the respective objects. While finishing his work, the engraver rests the plate on a small cushion, holding it with his left hand, while his right is using the graver. Landscape and architecture are generally executed with

the needle and aquafortis; portraits and historical subjects with the graver or burin. Etching with the dry point, as it is called, is performed entirely with the graver; the burr raised being taken off by a three-sided instrument with sharp edges called a scraper.

Stippling is a kind of engraving in which *dots* of various sizes and depths are used instead of lines. They are first made in the etching ground with the needle, or a toothed wheel called a roulette, and then bitten with more or less strength, as may be required; when it is cleaned, dotted by the needle, stippled with the graver, or re-bitten, until the necessary gradations of shade are communicated.

Mezzotinto is produced by grounding or puncturing the plate with an open-faced tool called a cradle, on which are a number of points; this instrument, being rocked regularly over the copper, covers it so completely with marks, that if it were printed from, the impression would be black. On this ground the subject is traced, and the various gradations of light and shade scraped and burnished out until the proper effect is produced. This style of engraving is chiefly used for portraits, and is very soft in appearance.

Aquatint engraving is an exceedingly complicated style of producing pictorial effect, but can be executed at a lower cost than the kinds previously mentioned;—it has therefore been much used for embellishing books of travels or works of a like kind. It was invented by a Frenchman in 1662, but has been practised more successfully in England than elsewhere. The process has latterly been superseded by lithography.

Engraving on Steel, which is now common for all plates of which large numbers are required, is executed much in the same way as engraving on copper. The plate is bedded on glazier's putty, and a ground of Brunswick black is laid on, through which the needle scratches. The biting menstruum is poured on, and managed as detailed already. An engraving on a steel plate may be transferred in relief to a softened steel roller, by pressure, and this roller, after being hardened, may again transfer the design to a fresh steel plate, and the design may thus be multiplied at pleasure.

Engraving on Wood.—This art, which is intimately connected with letter-press printing, was first practised at a very early date by the Chinese, who have, for ages, printed books by carving letters or figures in relief on a piece of wood, and then stamping the block, blackened with ink, on paper, silk, or some other light fabric.

In Germany, the first attempts at printing with a press, were effected by wooden blocks (*see* Printing), which, however, were soon abandoned, in consequence of the invention of printing from moveable types. The subjects of the blocks in general use before the introduction of printing proper, were chiefly of a devotional kind, such as representations of saints, or scenes from their times, and were distributed by the clergy, as tracts are now-a-days, as aids to devotion. The earliest print from a wood block for which we have any certain date, is in the library of Earl Spencer, and bears the date of 1423. The picture is meant to represent St. Christopher carrying the infant Saviour across the sea. It was discovered in one of the most ancient convents in Germany, the Chartreuse of Buxheim, pasted within one of the covers of a Latin MS. of the year 1417. About this time, too, wood blocks were used to print the figures on playing cards; and very little improvement has been made on the rude figures of those times, even to the present day.

Immediately before, and for some little time after the invention of printing, small books, composed entirely of wood-cuts, were common in continental countries. These prints were at first entirely without any text, or as it is now termed letter-press; but after the groundwork of the art had been laid, its rise towards perfection was unparalleled in rapidity. Historical subjects were composed, with a text, or explanation subjoined. The pages were placed in pairs, facing each other; and, as only one side of the leaf was impressed, the blanks were also opposite each other, and, being pasted together, gave the whole the appearance of a book printed in the modern fashion. Remarkable incidents in the books of Moses, in the Gospels, and in the Apocalypse, were thus made known to the uninstructed classes, but generally in connection with superstitious legends of the middle ages. One work of this class was known as the "Biblia Pauperam," or poor man's book; copies of it are now extremely rare. The work consists of forty leaves, of a small folio size, each leaf containing a cut in wood, with extracts and sentences descriptive of the subject of the cut. To those unacquainted with the estimation in which such ancient specimens of printing are held, it may be amusing to learn that fair copies have brought upwards of 2,500 Rupees, and the worst have rarely sold for less than 500 Rupees. Other works of a similar description might be mentioned, executed between 1430 and 1450, but they all present the same characteristics. Caxton, in 1474, attempted to ornament his work, "the Game and Play of Chess," with some few engravings, but the figures are rude and grotesque.

Wood engraving, to illustrate the Scriptures, was brought to great perfection by Albert Durer, at the end of the 15th century. During the 16th century the art flourished in Holland, Germany, and Italy, and had many eminent professors; but, as printing advanced, the art of engraving on wood declined, till, at the end of the 17th century, it had fallen into great neglect. In the 18th century, it again revived in France and England, but did not arrive at any great brilliancy till the time of Thomas Bewick, of Newcastle-on-Tyne, a self-taught enthusiast in the art. His illustrations to a history of quadrupeds issued in 1790, attracted much attention. From this time wood engraving was raised to the rank of a regular profession in England; and Nesbit, Harvey, Branston, Thomson, Williams, Dalziel, Linton, and many others, have greatly advanced the art, both in elegance of design and delicacy of execution. Many ladies have excelled in wood engraving; indeed, from the ease with which it is practised it is peculiarly adapted to them. I only mention here the Misses Williams, Mary Byfield, Eliza Thomson, and Mary and Elizabeth Clint, who have all risen to some eminence in the profession; but there are many others, not likely to be dependent on their own exertions for support, who have wisely, by learning this art, acquired both an accomplishment and a profession.

During the present century the increase of works containing wood engravings has been enormous. Less delicate, usually, than copper or steel, wood-cuts possess a peculiar value from the ease with which they can be printed. While impressions from plates are taken by a process so tedious, that at most 250 copies per day can be produced, wood-cuts may be printed with the greatest rapidity at a machine. The chief value of the wood-cut however, consists in its being adapted for printing with the letter press it is intended to illustrate. Within the last few years, gift-books, and other illustrated works, have been ornamented with wood engravings wonderful for their fulness and delicacy, and hardly second, in point of softness and finish, to copper plate.

In Europe, boxwood is generally employed for engraving. To obtain the blocks the tree is cut across in slices, and, after being planed smooth, these slices are cut to the required size. The blocks must be one inch in depth, that being the height of the type with which they are printed. When a block is required of more than six or eight inches square, two or more pieces must be joined together, by screws running across the whole width, and the surfaces planed to an

equality. Pear-tree wood is sometimes used for large, coarse cuts. In this country sandalwood is the general substitute for box.

The following is a list of tools required by an engraver on wood:—

1. A round, flattish, leather *pad*, filled with sand, on which to rest the block while engraving.

2. *Gravers.*—A graver is a tool about four inches long, of steel, with a small head, or handle, of wood: six or eight, of the different degrees of fineness, are necessary; the finest for the most delicate lines, the broader pointed for cutting broad, bold lines. Two of them should be slightly bent in the blades, to excavate hollow parts.

3. *Tint tools* of various sizes, suitable to the fineness or coarseness of the tint to be cut. They are chiefly employed to cut parallel lines, close together, representing the tints of the sky.

4. *A Gauge tool* for cutting away edges, and trimming the cut.

5. *A hone* to sharpen the tools upon.

6. *A steel burnisher.*

7. *An inking slab*, a dabber, and a small quantity of fine *printing ink*.

8. *India paper* for proofs; and two or three fine hard *black lead pencils.*

It is first necessary to draw the design on the wood; and therefore the ability to draw with neatness and precision, and a knowledge of light and shade, are indispensable to any one desirous of rising in the profession. Besides drawing, another branch has been added to this art, called *lowering.* The surface of the block being perfectly level, it is obvious that when printed at a press properly level, every line on the cut receives an equal degree of pressure. Now this should not be; the finer lines should receive a light impression, the dark ones be printed heavily. To procure this effect, the pressman (*see* Fine Printing) lays on patches of paper below his sheet, where he requires shade, and cuts out paper where he wishes to lighten the impression, but this mode fails to a considerable degree in making fine work; and the surer plan consists in lowering some parts of the surface of the block. After sketching the design, those parts which are to be printed lightly, are scraped away with the scooper, in various degrees, according to the degree of lightness required. Of course the designs have to be re-sketched before engraving.

Before making a drawing on the block the surface is slightly rough-

ened and delicately whitened all over with a mixture of powdered bath brick and flake white, slightly moistened, and the palm of the hand is drawn over the block to remove any gritty particles. When dry it is ready to receive the design.

As pencil drawing is easily blurred or rubbed out, the block must be covered while working on it. A slip of hard smooth writing paper should be folded across the picture, and be secured by a thread. On beginning to cut, a piece may be off, and the whole removed as the work proceeds.

The engraver should sit at a table or bench of a convenient height placed in a good light (not too glaring). He must hold the block on the pad in his left hand, and use the tool with his right. Steadiness of hand is of the utmost importance; for, as the picture is formed by the parts left in relief, and the white part and lights only cut away, the least slip in the wrong direction may ruin the effect intended to be produced.

Envelope Machine.—This little machine, as its name denotes, is intended to fold envelopes, and do away with the tedious process of cutting and folding them by hand. One, the joint invention of Mr. Edwin Hill and Mr. Warren De la Rue, is an exceedingly beautiful contrivance, and performs many successive operations with unerring accuracy. A boy places a diamond-shaped piece of paper on a little platform; a sort of plunger descends, and forces the centre of the paper into an oblong quadrangular cavity; the four corners now stand erect; an artificial arm takes a supply of gum from an endless blanket, and applies it to the proper place on the edges of the envelope; four fingers, or levers, press down and flatten the sides, and the envelope is made. Two India rubber fingers now lightly touch the envelope, draw it aside to make way for another, and place it on an inclined plane, on which it slides up into a box prepared for its reception. This machine makes about sixty envelopes in a minute.

Another, invented by M. Renaud, has a singular contrivance for feeding itself with paper. The diamond-shaped pieces are placed in a heap by the side of the machine; a hollow tube thrusts itself forward and rests upon the topmost paper, a tiny air pump draws the air from the tube, and the paper clings by atmospheric pressure to the two minute holes in the lower surface of it. The tube now withdraws itself, drops the paper exactly on the spot where it is to be folded

and gummed, and goes in search of another. This machine requires the aid of an attendant to remove the envelope.

Errata.—A list of errors that have escaped both the author and the printer. It is generally printed in small type at the end of the work, and should never be brought out in a prominent manner.

Even Lines.—When printing has to be executed in great haste, a number of compositors are employed, and the copy is cut into small pieces for each. If the copy should be in long paragraphs, the compositors have each to begin a line and make their copy end a line, frequently with great irregularity of spacing. This is termed making even. In Newspapers it is of constant occurrence.

Even Page.—The 2d, 4th, 6th, 8th, or any even numbered page.

F.

Face of the Letter.—The surface of the letter extremity of the type.

Face of the Page.—The upper side of the page, from which the impression is taken.

Falling out.—A term generally applied to a page, quarter, or whole form, which drops away from the chase, through the shrinking of the wooden furniture and quoins. This accident can hardly occur without gross carelessness, if metal furniture is made use of.

Fanning out.—A term used in the warehouse in counting work. By taking hold of the right hand lower corner of the paper between the forefinger and thumb, and by a peculiar turn of the wrist spreading out the upper part of the paper somewhat in the resemblance of a fan, the sheets can be counted with the greatest facility.

Fat—With compositors, is light open matter, and short, or blank pages. With pressmen, light forms.

Fat-face Letter.—Letter with a broad, black face, and thick stem. It is seldom used now.

Feet of a Press.—That part of a press upon which it stands.

Fine Presswork.—The technical name for work of a superior quality. The art of printing perfect impressions from a form of types, or from the surface of engravings in relief. To do fine work, the press must be in good working condition. The joints of the tympan must have no play, or they will affect the register and cause slurring. The parchments must be thin and even, and stretched

perfectly tight on the tympans, so as not to be baggy or flaccid. The printers in France sometimes use silk for their tympans, for their finest work, on account of its smoothness and uniform thickness. The face of the platten must be a true plane, and parallel to the surface of the table, or the impression will be heavier at one side, or at one end, than at the other. The rollers must be smooth and even, with a good face, and neither too hard nor too soft.

In India, the presswork is of a very low standard, but it may be improved with care and patience. Pressmen do not understand making ready a form, but endeavour to bring up inequalities by dint of extra blankets and heavy pulls, to the great detriment of the type. It is evident that this cannot give the sharp, clear impression required in fine work, for the elastic blankets cause the paper to partly fill up the blanks of the types, and makes the best and newest appear round and worn at the edges.

To obtain good impressions in fine work, the blankets must be nearly or quite discarded, and paper used in the tympans, and of this, not too much. I have seen a milled board put at the back next to the outer tympan, to make the impression hard and sharp, but I do not recommend this generally.

After laying on the form and justifying it firmly in the centre of the press, the pressman should pull a sheet of dry paper, without ink, and examine the back to see if the impression is the same throughout. This is rarely the case; and he must therefore overlay the faint, or light places, and cut away the heads, folios, edges, or any other part in which the impression may be heavy, so as to equalize the colour and impression over the whole sheet.

This sheet is placed *in* the tympans, that is, between the inner and outer, exactly over the corresponding pages of the form, and a few sheets of thin soft paper, or a very fine light blanket (only one,) is laid on it.

The pressman now pulls a second sheet, and examines the effect of his overlays, and if not yet correct, adds to the overlays, or *vice versâ*, till he is quite sure the pressure of the platten is equal on every part.

When short pages occur in a form, the bottoms of them, and the edges of the neighbouring pages will print too hard, and not prove a clear impression; in these cases bearers are necessary to protect them (*see* Bearer.)

In working the white paper when very thick, it is better to use a card duck-bill to prevent the paper slipping, as it is not so likely as pins to bruise the paper.

After laying on a form in which wood-cuts (or wood-engravings) are inserted, a gentle, careful pull must be used for the first impression, for fear of crushing some of the fine lines; after the first pull the workmen will know what impression is required, and regulate it accordingly.

It will generally be found in a first impression that the appearance of an engraving is flat, rough, and indistinct; too hard and black in some parts, too soft and pale in others, and with no middle tint. To produce the desired effect, and give the picture the appearance the artist intended, is the business of the pressman, and he accordingly proceeds to *bring up* his wood-cut to the standard of the proof rubbed off by the engraver. To do this properly requires great nicety and attention, and an artistic knowledge of the properties of light and shade would be most useful. Where the impression is too strong, the parts must be cut away, and where too weak, overlays be added. The overlays are always best made with thin soft paper, and the edges should be scraped down, or in many cases the impression will be too sharp. A few copies of the cut should be pulled, and the overlays taken from them, as they may then be cut to the exact shape required, from the impressions taken. The light parts require but little pressure, and they should be cut out from as many thicknesses as are necessary; but the shadows must have a full, firm impression, which is secured by the overlays causing the impression on the sheet to be so heavy on those parts as to take off all the ink.

If a block is too low it must be underlaid; and if worked with type it should be raised about one-tenth of a pica above it, because the letter press requires much less impression than the engraving, and if the pressure on both is the same the type will look thick and worn, and so spoil the appearance of the work.

The edges of engravings always require toning down, for if the same pressure is left as on the body, they will come out thick and muddy.

Wood-engravings must never be washed with lye, as it will cause them to warp, but if necessary a soft brush and a little turpentine may be used to clean them.

In all fine work, whether letter press or cuts, it is of the first necessity to have a good roller, as a bad one will only turn out bad work.

The person who is rolling must look at the impressions every two or three sheets, to see that he is keeping his colour uniform ; as nothing looks worse in a book, than to see one page or sheet black and heavy, and the next gray and hardly readable.

First Form.—The form the white paper is printed upon.

First Page.—The commencement of a book, or the first page of a sheet or signature.

First Proof.—A proof pulled immediately after matter is composed, for the purpose of comparing it with the copy. It may either be pulled in galleys, or after it is made up into pages and imposed.

Flowers.—Ornaments for making borders to jobs, cards, pages, and wrappers, and for embellishing chapter pages, or as tail-pieces to books.

Fly.—A man or boy who takes the sheet from the tympan as the pressman turns it up. This is seldom done now, as when great expedition is required, work is usually laid on a machine.

Fly the frisket.—To turn down the frisket and tympan by the same motion. This should always be done, as it saves time, on ordinary work ; but not when very superior heavy paper is used.

Folding.—Doubling the printed sheets so that the pages fall consecutively, and exactly opposite to each other, preparatory to binding.

Folding Machine.—An instrument invented by Mr. James Black, and first exhibited in 1851, when it obtained a prize medal. By this machine all kinds of sheets may be folded which are multiples of four, as 8vo., 12mo., 24mo., 32mo., &c. A diagram would be necessary to make the construction clear, but the following description may serve to give a general idea of it. A main shaft is driven by steam, manual labour, or other motive power ; attached to this are two cams or wipers, which lift up two vertical knives or folders. United to the end of the horizontal shaft by bevelled wheels is a vertical shaft and cam, which moves an horizontal knife. Each knife moves on a centre ; and when a printed sheet is laid on the machine to the proper registering points, the first vertical knife moves rapidly down, folding the sheet in the middle, and carrying it to the horizontal knife, which seizes the sheet at right angles to the first, produces another fold, and carries on it to the second vertical knife, which again takes it at right angles to the last, and delivers it a folded octavo sheet between two rollers in front of the machine. The knife, after having performed its peculiar offices, is brought

back to its former position by balance weights. The knives, or folders, are finely serrated on the edges, to prevent the sheets from slipping, and so spoiling the register.

This is a most useful instrument, and is so simple in its working that a boy of ten or twelve years of age is all that is necessary to attend to it. It may be made to fold any size of page by merely altering the registering points, and will fold 2,000 sheets per hour.

Folio.—The running number of the pages of a work. When there is no running title, or head line, the folio is placed in the centre of the page, when there is a running title, at the outside corner. The preface, contents, index, and all introductory matter, usually have separate folios inserted in roman lower case numerals.

Folio.—The size of a page, when the paper on which it is printed is folded in two only ; as post folio, foolscap folio, demy folio.

Foot of the letter.—The bottom of the type.

Foot of a page.—The bottom of a page.

Follow.—That is, see if it follows. This term is used by readers, compositors, and pressmen. By the reader or compositor when he ascertains that the first line of a page or sheet agrees with the last line immediately preceding it, and how the folios numerically succeed each other.

The pressman merely ascertains that the first page of the inner form follows the first page of the outer, or whether, in half sheets, he has turned his heap correctly.

Foot-stick.—A piece of furniture, sloped or bevelled from one end to the other, placed against the foot of the page. The slope allows the wedge-shaped quoins to be driven hard in between the footstick and chase, and so secures or locks up the form or page.

Fore-edge.—That part of a sheet of paper which, folded to the proper size of a book, makes its outer edge.

Form.—Any number of pages imposed and locked up in a chase, whether a card, broadside, or book-work.

Form dances.—When the lines are not properly justified, when letters have slipped at the ends of lines so as to prevent the pages being properly locked up, or when a letter, space, or quadrat of a deeper body is by accident made use of, causing the types to fall lower than they should do without entirely dropping out, the form is said to dance.

Form lifts.—When on being raised from the stone, nothing falls from it.

Forty-eight mo.—A sheet of paper folded into forty-eight leaves, or ninety-six pages.

Foul proof.—A dirty proof, a proof with many errors or corrections marked in it.

Foul stone.—An imposing stone or table which the compositor has not cleared after working at it.

Fount.—A certain weight of letter cast at one time, of the same face and body, and when complete containing due proportions of capitals, small capitals, lower case, figures, points, four kinds of spaces, en, em, two, three and four em quadrats, and accents.

Fount Cases.—Very large cases, to hold the surplus sorts of a fount.

Fractions.—A fraction is a part of a unit, written with two figures, with a line between them, thus ;—$\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{3}$, $\frac{3}{8}$, $\frac{5}{8}$, &c. The upper figure is called the numerator, the lower the denominator. The fractions cast in one piece are $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{2}{5}$, $\frac{3}{8}$, $\frac{3}{5}$, $\frac{3}{4}$, $\frac{4}{5}$, $\frac{5}{6}$, $\frac{5}{8}$, $\frac{7}{8}$. Fractions are also cast in two pieces, called split fractions, by which the denominators may be extended to any amount. The separatrix, or rule between the figures, was formerly joined to the foot of the first, but is now attached to the head of the denominators.

Fragments.—Any pages left after the last sheet of a work, and imposed with the title, contents, or any other odd pages, to save press and warehouse work.

Frame.—A platform made of some light wood, on which cases are placed in a sloping position to be composed from. The upper case should be placed at a greater angle than the lower, to bring the upper boxes nearer to the compositor.

French Furniture.—Pieces of metal cast to pica ems in length and width, used to make margins for books, to fill up blanks and short pages, and for all other purposes to which wooden furniture can be applied. From the great care and nicety shown in casting the various sizes, it is invaluable for making up blank forms.

French Rules.—Ornamental brass rules, swelling in the centre, of different lengths, and generally used to separate chapters in a book. Also called swell rules.

Friars.—Light patches caused by the roller not taking ink properly, or by the ink being imperfectly distributed.

Frisket.—A thin iron frame, covered with paper, and attached to the head of the tympan by a joint. The parts of a form that are to be printed on are cut out of the paper covering, and the frisket being turned down upon the sheet on the tympan, keeps it flat, prevents the margins being dirtied, and raises it from the form after being printed.

Frisket-pins.—Iron pins passing through the frisket joints, and connecting it with the tympan.

Frisket stay.—A slight piece of wood fastened to the ceiling of the press-room, or some other convenient place, to support the frisket when turned up. It is sometimes called a gallows.

Fudge.—To execute work without the proper materials.

Full Case.—A case full of letters, wanting no sorts.

Full Form.—A form without blanks or short pages.

Full Page.—A page containing its full complement of lines, or with few or no breaks in it.

Full Press.—A press at which the two workmen are continually employed.

Furniture.—Pieces of wood or metal used in whiting out pages or jobs, for margins to books, and for imposing and locking up forms. It is generally classed as reglet, furniture, side-sticks, foot-sticks, and quoins. It is made of quadrat height, about ⅝ths of an inch. Reglet is of various type depths, from pearl to great primer ; furniture from three to eight pica ems in width, and of any required length. Foot and side sticks are described under their respective heads.

G.

Galley.—A thin moveable frame or plane of wood, brass, or zinc, on which to empty matter from the composing sticks as it is set up, and to afford a level surface for making up pages. Galleys are made of various sizes and widths, from the long narrow news or slip galley, to folios, to suit the different sizes of pages.

Gathering.—A term used in the warehouse department for collecting the sheets of a work in orderly succession for delivery to the binders.

Gathering-table.—A table on which printed sheets are laid in the order of their signature, to be gathered into books.

Gauge.—A piece of reglet on which the length of a page is marked, for the compositor to make up by. Also a card, on which is marked the width of the heads, backs, and gutters of the furniture used in the first sheet of a work, so that the margins of all succeeding sheets may be made the same.

Gelatine Paper.—A material invented by the late Mons. Grinet, of Rouen. It is commonly manufactured in sheets measuring 22 inches by 16, but may be made of any size or thickness required. It can be obtained as transparent as the best glass, and more free from colour, or may be of all colours or shades. It is exceedingly light, and can be bent or rolled without injury. It is often used in Europe for fancy or ornamental printing.

Gets in.—A term used when more is got into a line, page, or form, than is in the printed copy a compositor sets from ; or when M.S. copy does not make so much as it was calculated to.

Girths.—Thongs of leather, or bands of stout webbing, attached to the rounce, and used to run the carriage of a press in or out.

Giving out paper.—Delivering paper for any job or sheet of a work to the pressmen or paper dampers.

Glazing Machine.—A machine used for putting a polished surface on printed papers, or for burnishing gold and colour work. It consists of two massive iron cylinders, turned by a cog and fly-wheel, with power top-gear to increase the pressure. The sheets to be glazed are placed between polished copper plates, and so passed through the cylinders.

Glyphography.—From two Greek words, *glypho*, I engrave, and *graphein*, to draw ; a method of producing engravings, or pictures, invented and patented by Mr. Palmer.

The description of this art will be best given in the words of the patentee. " The term signifies that art by which an engraving is produced by the simple mode of drawing; or in other words, drawing and engraving, which have hitherto been two distinct operations, are here combined in one. By its aid the artist becomes the engraver of his own work, as much as by the practise of etching ; but with this difference, that here his effect is as immediately conspicuous as though he were using a black lead pencil on paper." "A piece of ordinary copper plate, such as is used for engraving, is stained black on one side, over which is spread a thin layer of a white, opaque composition, resembling white wax in its nature and appearance : this done, the plate is ready for use. In order to draw properly on these plates,

various sorts of points are used, which remove, wherever they are passed, a portion of the white composition, whereby the blackened surface of the plate is exposed, forming a striking contrast with the white ground, so that the artist sees his effect at once. The drawing being completed is inspected very carefully and minutely, to see that no part of the work has been damaged, or filled in with dirt or dust. The plate is then brought into contact with a substance having a chemical attraction or affinity to the composition thereon, whereby the remaining portions are heightened *ad libitum*. Thus, the heights of the drawing become thickened all over the plate equally, and one great difficulty is overcome. But as the depth of these lights, or non-printing parts of the block, must be in some degree proportioned to their width, the larger breadths of light must be thickened on the plates to a much greater extent. It is indispensably necessary that the printing surfaces of a block prepared for the press shall project in such relief as shall prevent the inking roller touching the interstices while passing over them. In wood engraving this is accomplished by cutting out the parts which form the lights of the print to a sufficient depth, but in glyphography the depth is formed by heightening the remaining portions of the white composition on the plate. If the composition was spread on the plate as thickly as required for this purpose, it would be impossible for the artist to put either close, fine, or free work thereon; consequently, the thinnest possible coat is put on previous to the drawing being made, and the required thickness is obtained ultimately as described. The plate thus prepared is again carefully inspected through a powerful lens, and closely scrutinized to see that it is ready for the next stage of the process, which is to place it in a trough, and submit it to the action of a galvanic battery, by means of which copper is deposited in the indentations caused by the drawing, and filling them up it gradually spreads itself over the surface of the composition, till a plate of copper is obtained, which, on being separated, will be found to be a perfect cast of the drawing which formed the matrix. This plate is soldered to a piece of white metal to strengthen it, and it is then mounted on wood to bring it to the height of type, and it is now ready for printing. If any parts of the block still require to be lowered, it can be done with the greatest facility when mounted."

The blocks are printed from precisely as wood-cuts. Some very beautiful specimens have been printed in the Art Journal; but, generally, glyphography has not been able to compete with ordinary wood-cuts. It has some advantages, one of which is the great durabi-

lity of the blocks, upwards of 70,000 impressions having been taken from one without deterioration; another, and not the least, is its cheapness.

Good Colour.—When a sheet is printed neither too white nor too black.

Good Copy.—Printed copy, or M.S. written in a clear, legible hand.

Good Work.—Light, easy copy, well paid; or work turned out cleanly and correctly by the printers.

Gothic.—The name of a fancy fount used for Job Work.

Great Primer.—A type, a size smaller than Paragon, and larger than English. There are 51¼ lines to the foot.

Groove.—An indention on the upper surface of the short cross of a chase, to receive the spurs of the points, and allow them to make holes in the paper without being themselves injured.

Guillotine Paper-cutting Machine.—This machine, the invention of Mr. Wilson, is of iron, with a mahogany table on which to place the paper to be cut. A moveable gauge is attached to a slide which runs in a graduated scale, by which the size to be cut can be regulated to the sixteenth of an inch. When the paper is in its place it is held immovably by a platten and screw; a cog wheel which moves in a rachet attached to a large knife, is turned, and the knife descends, cutting through the paper with great rapidity. The wheel is now reversed in its motion, and the knife ascends preparatory to a fresh cut. In a book-binding establishment one of these machines will do the work of six men.

Gull.—To tear the point-holes in a sheet of paper while printing. This is generally caused by the end of the spur being turned, and may be remedied by filing it to a tapering point. At times a gull is caused by the points not falling fairly in the centre of the groove.

Gutters.—The furniture separating two adjoining pages in a chase; as between folios 1 and 8 in a half sheet of 8vo.

H.

Half Press.—When one man only is working at a press.

Hang up.—In warehouse work, is to place printed sheets upon the drying poles. To do this the warehouseman should take the peel in his left hand, and lay it flat upon the heap to be hung up; he should

then turn over on it from six to a dozen sheets, according to the thickness of the paper, taking care to have the fold in the centre of the short cross, as, if it falls across any of the newly printed pages they will most likely smear and set off. Having folded these sheets down he must lift the peel two or three inches to the left, take another fold, then shift it, and so on till he has as many folds as he can conveniently lift. Then raising the sheets above the poles on which the work is to be hung, and sloping the handle of the peel, the folds will open at the under side, and they may be lowered and hung on the poles. The peel must now be withdrawn from the centre, and be inserted between the first and second folds, or lifts, which are to be shifted on, letting the second overhang the first, and so on till all are spread out; when the process is repeated till the whole heap is hung up.

Hard impression.—When there is too much pull on the press, and lines which should be soft and delicate, come up heavy and strong.

Head-band.—A thin bar of iron, connecting the two sides of tympans at the top; it is made thin, to allow it to run under the platten without impediment.

Head-line.—The top line of a page containing the running title and folio. When there is no running title the folio is styled the head line. Chapter lines are also head lines.

Head of a page.—The top, or upper end.

Head-page.—The first page of a work, or any page on which a division or chapter commences.

Head-piece.—An ornament placed over the commencement or other division of a work. It may be an engraving or composition of type ornaments. Head-pieces are now going out of fashion.

Heads.—The pieces of furniture placed at the tops of pages to make the margin.

Heap.—As many reams or quires of paper as are given out by the warehouseman to be wetted for any particular work. Also the quantity of paper a pressman has on his bank for striking off a form.

Home.—A term used by pressmen to denote that the bar of the press is pulled down till it touches the near cheek.

Horse.—An inclined platform on which the heap to be wrought off is placed by the pressman.

Hydraulic press.—This machine, which is of very general use, is highly necessary to printers to smooth or take out the marks of the

impression from sheets which have been printed on. The following description of its action is from Nicholson's Journal of Natural Philosophy. "When the lever, or pump handle is raised, it brings up the piston, which would leave a vacuum beneath if the pressure of the atmosphere did not force the water in through a side valve. The lever is then to be pressed down, which causes the side valve to shut, and forces the water through a valve at the bottom, whence it passes through a pipe into the cavity of the great cylinder, and raises the piston, or ram. A repetition of the process forces more water in, and the pressure may in this manner be carried to a great extent. The hydraulic press was invented by Mr. Joseph Bramah, of Piccadilly."

When it is used by printers the dry sheets are placed between milled or glazed boards, first a sheet and then a board. These boards are put in the press, and between every hundred or hundred and fifty a thick wooden board is inserted, to make the whole pile solid. As soon as the whole space between the table of the press and the head is filled, the press is pumped up, as described above. When sufficiently tight it is left standing for a few hours, and on letting it down and taking the sheets from between the boards, they are found to be perfectly smooth and glossy.

Hyphen.—A mark (-) used when a word is divided, and the first part written or printed at the end of one line, while the latter part is at the commencement of the next. It is also employed in connecting compound words, as, mother-in-law, pre-ordained.

Imperfections.—In the warehouse, are dirty, spoiled, or incomplete copies of a work. In the composing room, or with typefounders, when one or two sorts run out, leaving the rest useless, they are called imperfections.

Imperial Press.—A press invented by Messrs. Sherwin and Cope, which is thus described by Dr. Lardner. "In this beautiful and compact machine the works upon which the power depends are almost concealed within the head of the press. The leverage connected with the bar is similar in principle to that of the Stanhope press; and its distinguishing peculiarity consists in the manner in which the lever, called the chill, is made to act upon the piston. This lever, or chill, terminates in a sort of polished toe, or point. The last mentioned projection of the lever is made to act on a cup, or knuckle, acting upon the head of a stout iron ball, which simply drops down the perforation of the piston, so as to rest upon the uppermost of two steel wedges, one of which, connected with a screw in front, is used to regulate the pressure of the platten on the types."

Imposing.—Arranging the pages of a sheet or form in their proper order on the stone, and locking (or wedging) them up in a chase, with a view to their being printed.

Attention to the following remarks is essential to any one wishing to become a good workman.

We will suppose the compositor has made up sufficient matter to impose a sheet. The pages being laid upon the stone in their proper order, and as near the required distance from each other as can be determined by the eye, the compositor should take his chase in both hands and lay the off side in 8vo., the end in folio or 16mo., on the stone, at the outer side of his page, and lower the near side gradually till it lies flat on the stone, taking care that the edges or heads of the pages are not touched in its descent, or the soft metal types will be injured. Before proceeding any further he should look over all the pages to see if they are laid down correctly, and also observe whether the groove side of the short cross is uppermost. He should now place the furniture round the pages. French furniture, which is of metal, cast to pica ems, and can be made up to any size required, is the best to use; but if not in the office, wooden furniture must be cut to the proper length. Before cutting up furniture the margin should be measured by a sheet of the paper on which the work is to be printed. Having dressed the chase, that is, put the proper furniture between the pages, and side and footsticks all round, the compositor should proceed to untie his pages, beginning with the page in the angle next the two crosses. Pushing the furniture close up, and holding it firmly with his left hand, he must take hold of the end of the page-cord with his right, and gently draw it up, gradually unwinding it from around the pages. Now, in 8vo., untie the outer page, but in 12 or 16mo., the page under the first, next to the long cross; and when the whole quarter is untied put one or two quoins in to secure it while untying the rest. When all the cords are off he should examine the margin carefully, to see that it is quite correct, inserting one or two scale-boards or leads in the backs, short cross, or heads, to enable the pressman to make register, if there is any inequality in the crosses, by either changing their situation or taking them away. Before quoining up, the compositor should place his thumbs against the footstick, and raising it a little, he will see if his pages are of equal length. If the bottom lines lift up with it, he may be certain they are right; if the corner of either of the pages drops, it is equally certain that one of them must be wrong, either long or short. In this case he must take his page-gauge, rectify the error, and then quoin up.

After pushing the quoins up tightly with his fingers all round the form, he should plane the pages down, tapping the back of the planer gently with the handle of the mallet; if any letters stand up they will be driven down by this, unless dirt, or a splinter of furniture happens to be underneath.

It is now necessary to look round the pages to see that no letters or folios have slipped, which often is the case in leaded matter, and if all is right the form may be locked up. This should be done gently all round at first, to avoid bending the crosses; but afterwards, the form may be locked up as tightly as necessary, and again be planed down, with sharp, clear blows, as if the planer shifts it may batter the types. If any thing is under any one of the pages, care must be taken not to plane that down, but after locking up, the form must be lifted, the substance under the types be picked out, the form laid down again, and the quarter unlocked, the page or quarter be planed down, and then be again locked up.

The form should now be drawn to the edge of the stone, and lifted slightly, to ascertain that all the letters are secure; if any of them dance the cause must be discovered, and if it is owing to bad spacing or a wrong founted letter in, the compositor in whose matter it occurs should be called to remedy it, but if the letters will not lift owing to slips at the ends of the lines, the imposer himself must correct it.

In imposing from forms which have been worked off, it is necessary, if the work is in sheets, to use the furniture as it has been used before; that is, to impose the outer form with the furniture which has been previously used for the outer form, and the inner with that used for the inner form. This is because the pressman has made register in the outer form, and it will most likely save him much time in laying on again.

The chases for a sheet must always be in pairs, as otherwise it will be nearly impossible to register correctly, at least, there will be much trouble in doing so.

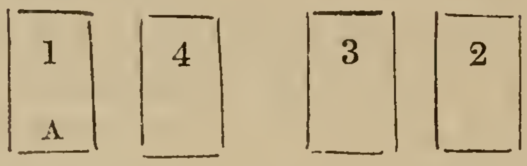
Neither the sidestick nor the footstick should project beyond the other, as it will prevent the quoins from passing, and in unlocking will give a great deal of trouble. It often happens that the projecting stick is spoiled in such a case; and the pages are likely to be either squabbled or broken. If there is room in the chase, when either side or footstick is too long, it will be best to put furniture at the sides or feet of the outside pages, as that will obviate cutting, and help to fill up the space.

The following are the Schemes of Imposition most useful in this country:

Schemes of Imposition.

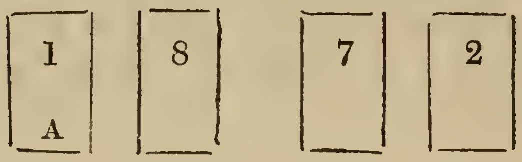
Sheets of Folio.

Outer form. Inner form.

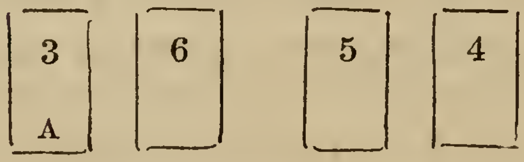


Two sheets in Folio, Quired.

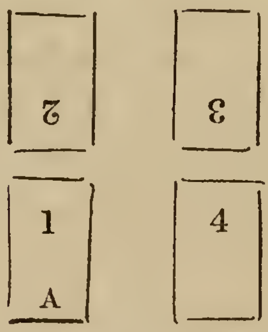
Outer Form of outer sheet. Inner Form of outer sheet.



Outer form of inner sheet. Inner form of inner sheet.

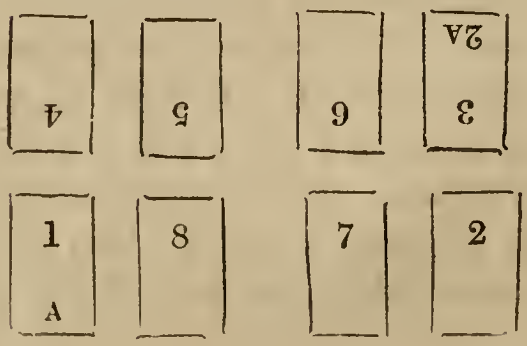


Half sheet of Quarto.



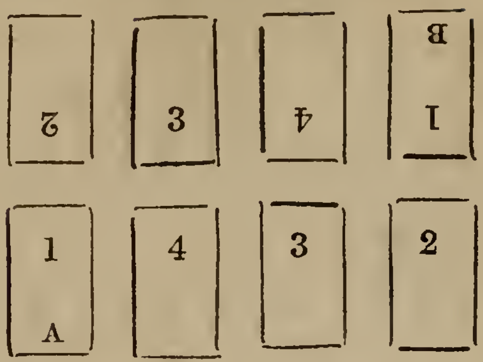
Sheet of Quarto.

Outer form. Inner form.



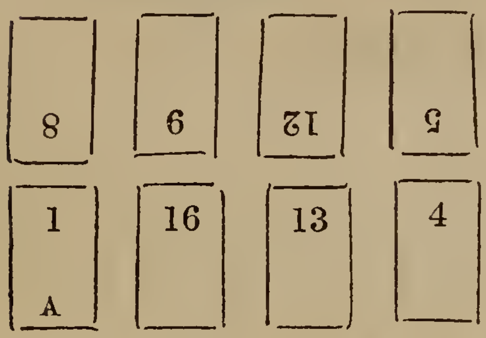
Half sheet, Octavo.

Two Quarters, Octavo.

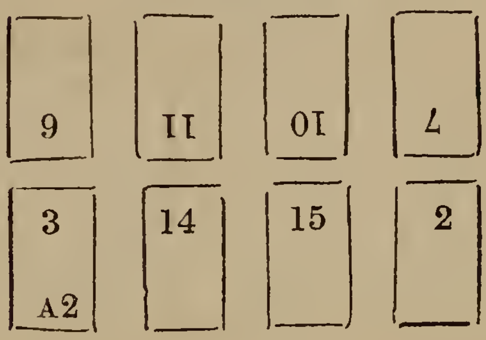


Sheet of Octavo.

Outer form.



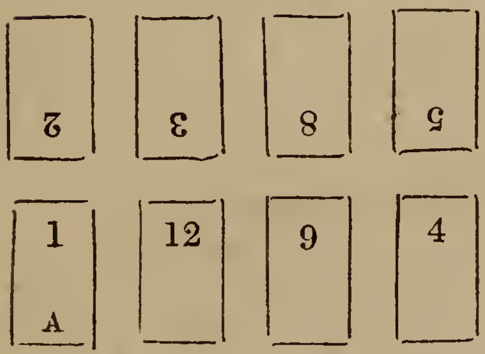
Inner form.



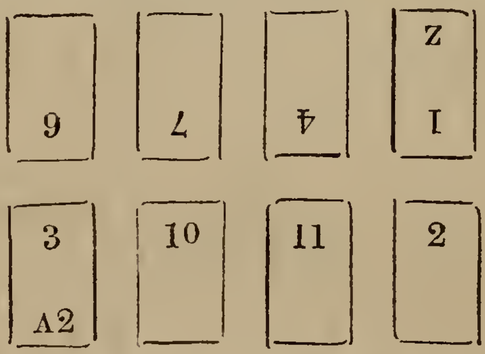
Sheet of Octavo with two Signatures.

Twelve pages of a work, and four of other matter.

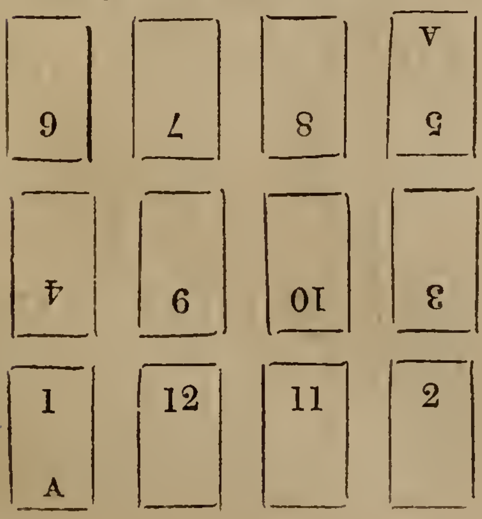
Outer form.



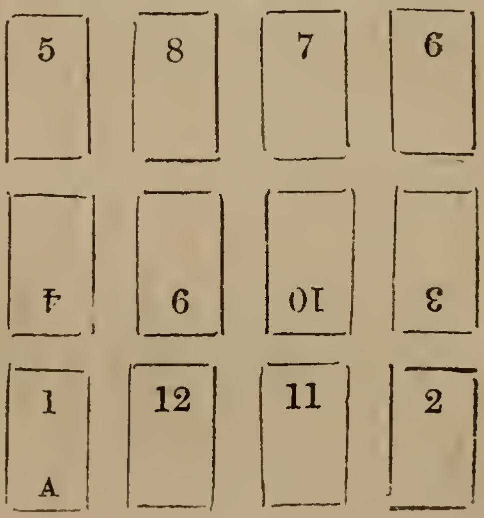
Inner form.



Half sheet of Twelves.

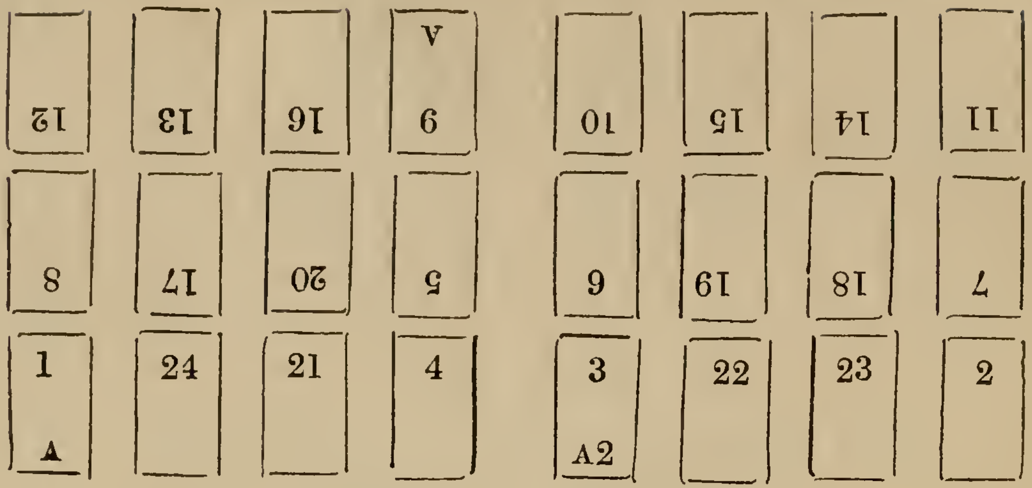


The same without cutting.



Sheet of Twelves.

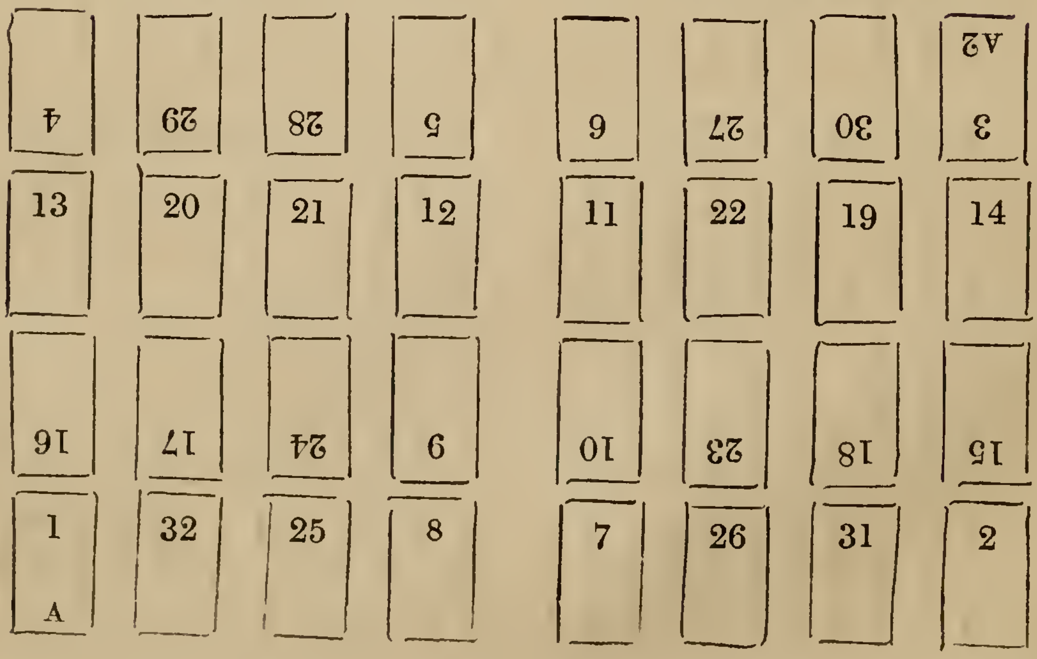
Outer form. Inner form.



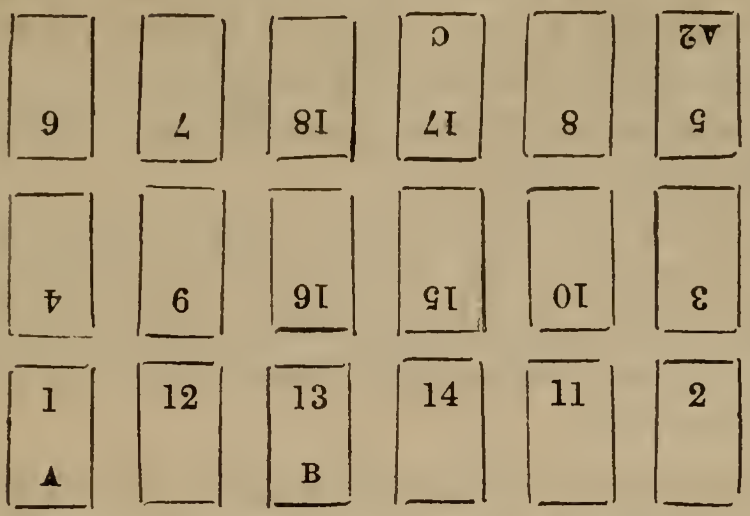
Half sheet of Sixteens.

Sheet of Sixteens, with one signature.

Outer form. Inner form



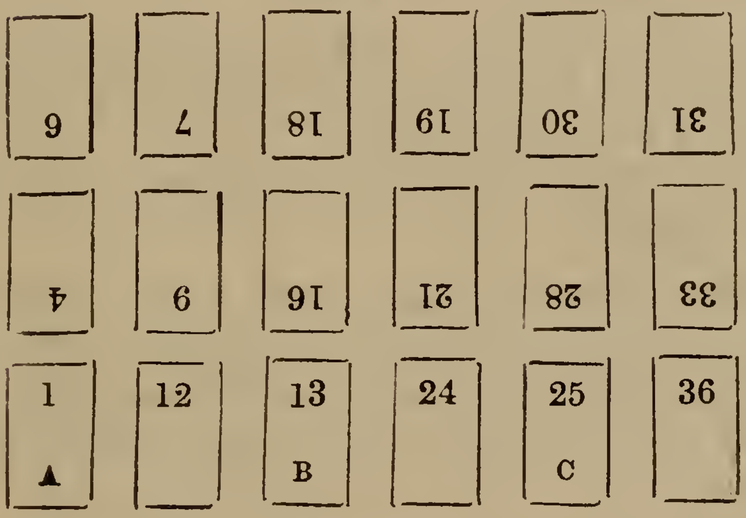
Half sheet of Eighteens, without transposition.



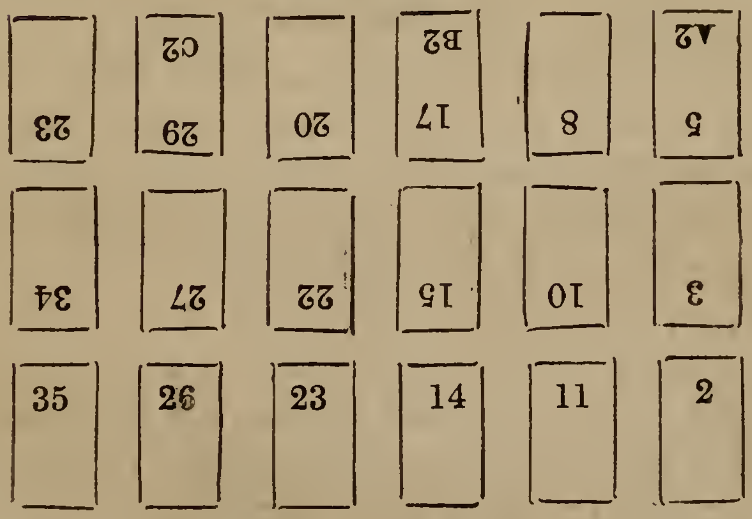
NOTE.—Only useful for stitched pamphlets.

Sheet of Eighteens, with three signatures.

Outer form.



Inner form.



Imposing Stone.—The table on which the compositor imposes and correct his forms. All "correcting tables" were originally formed of stone slabs, fitted on a wooden frame; but lately iron surfaces have been pretty generally introduced, but still retaining the old designa-

tion. Imposing stones are made of various sizes, to suit their situation, and are mounted on frames containing drawers for holding quoins, furniture, and mallet, shootingstick and planer.

Impression sheet.—A sheet of stout even paper, that exactly fits the inside of the outer tympan.

Imprint.—The name and place of residence of the printer of any newspaper, book, or job. In the former it is placed at the foot of the last column; in books on the back of the title or at the foot of the last page. Also the name of publisher and place of publication at the foot of the title page.

Indestructible printing.—By this process, which is the invention of Messrs. Adams and Gee, printers, of Cloth Fair, London, metal plates, of the thickness of ordinary sheet tin, may be printed on with ordinary type, the plates being first coated with a whitish composition. The sheets thus printed upon are afterwards subjected to a japanning process, and an even lustrous surface is produced, which can only be acted upon by a sharp instrument.

Index, or hand ☞, used to direct the reader's attention to some particular passage.

India paper.—A peculiar paper, made in China, which is used to obtain fine, or "proof" impressions of engravings. There is a smooth and rough side to this paper, which is made on the smooth surface of a stone, by applying the pulp with a brush, the rough side having the appearance of paint applied by an unskilful hand.

Ink.—The composition used to obtain printed copies from a form of types or engravings, either black or coloured.

Ink table.—A table for distributing ink equally over the rollers, made either of wood or iron. Tables as described below are in use in the Government Press, and were made in this country. A wooden frame is covered with sheet iron, to form the distributing surface. The ink trough is placed at the fore edge, and is composed of an iron roller, or ductor, turned true, and a plate of steel. The edge of the steel presses against the roller by means of weights and levers, and prevents the ink, which is placed between the plate and roller, from escaping, except when the roller is turned by the pressman. When the roller is turned round it becomes covered with a thin film of ink, the inking roller is dabbed against this, rolled backwards and forwards over the distributing table several times to spread it evenly all over, and is then passed two or three times over the form. A cover is fixed by hinges over the ink duct, to prevent dust and dirt from settling in the ink.

Inner form.—In working sheets, is the form that has the second page in it.

Inner tympan.—A frame covered with parchment, which fits into the outer tympan. Two flat points slip under the head board of the outer tympan, and secure that end in its place, and the sides are kept down by hooks on each side of the outer tympan, which turn round studs fixed in the inner frame.

Inside Quires.—Perfect quires of paper, of twenty-four good sheets each, thus designated to distinguish them from outside, or corded quires.

Its own paper.—A term used by pressmen when two or three proofs are to be pulled on the paper used for printing the same work.

J.

Job.—Any thing printed (with the exception of newspapers) which does not exceed a sheet in quantity Cards, Blank Forms, Circulars, Bills, Posting Bills, Cheques, or Receipts, &c., are also Jobs.

Job House.—A printing office in which the general run of business is the printing of Jobs.

Joined.—When several compositors are engaged upon the same work, and one has composed all his copy, so that nothing intervenes between his matter and that of the compositor who follows him, he says he has joined, or set up close.

Justifying.—Spacing out the lines so that they fit the stick with a proper degree of tightness; or placing matter of different measures in pages, so that when locked up it may be fast, and the lines above and below even.

Justifying the Stick.—Is making up the measure, or width to compose in, and securing the slide of a composing stick to the required size.

K.

Kerned Letters.—Letters that have a part of their face hanging over one or both sides of the shank.

Key.—A flat, square hook, with a loop handle to put the fingers through. It is used to lift forms out of the lye trough, after the ink is brushed off.

Knock up.—In warehouse work, is to place the edges of the sheets of each signature of a work uniformly even with each other, so that dust or dirt may not soil any part of the margins if kept long standing.

L.

Lay down.—To place the pages of a sheet or half sheet on the stone, preparatory to imposing them.

In the warehouse this term denotes placing the sheets of a work in proper order on the table, prior to gathering.

Lay Letter.—To put new type into cases, in the proper boxes.

Lay on.—To place a form on the press, and prepare it for striking off.

Lay up.—To wash the matter in a form, and prepare it for distribution. The best way of doing this is to unlock the form on a board, and while water is allowed to run over it work the pages backwards and forwards with the fingers. When the water runs off clear the form is sufficiently washed. Matter may be washed in brass or zinc galleys in the same way, but galleys made of wood will spoil by being wetted. Laying up is very necessary for the preservation of type, as if not carefully cleaned the ink will accumulate round the edges of the letters, or fill up the sunk parts. In the first case, the types appear to stand apart, as if they were spaced, and they can only be made to close properly by scraping, which is likely to batter them; in the second they appear as a black blot only, and are certain to be marked as bad by the reader.

Leaders.—Dotted quadrats, to resemble full points, two or three on an em. They are cast to one, two, or three ems, and are used to lead from the ends of lines to the figures of reference in indexes, contents, tables, or accounts.

Leads.—Long pieces of metal, of various thicknesses, from three to twelve to a pica, used for placing between lines, or whiting out heads, titles, or other open work. They are cast quadrat height, are called leads by printers, and space lines by type founders.

Lean faced.—A type of very thin proportion as compared to its height.

Letter board.—A board on which to lay up forms for distribution.

Letter brush.—A brush used in composing rooms to dust the faces

of forms which have been kept standing for any length of time, previous to pulling a proof.

Letter founder.—A person who manufactures type from metal; sometimes styled type founder.

Letter foundry.—A place where letter is cast; sometimes called a type foundry.

Letter hangs.—When the compositor has been careless in emptying his composing stick, or has not locked up his pages properly, the ends of the lines will bend, which is called hanging.

Lift.—When a work is nearly completed, and perfect copies are required before the whole number can be worked off, it is usual to print from 100 to 250 sheets of each form. If there are many forms to strike off, it is usually impossible to lay on each at a different press, and therefore, after perfecting a certain number of sheets, the form is "lifted," and another laid on. When all have had perfect copies struck, the previous forms are laid on again, and the proper number completed. Much time in publication is sometimes saved by this.

Ligatures.—Two letters cast together on the same shank, in cases where one is kerned, and would be battered by locking up against the shank of the next letter. There are but few used now, ff, fi, fl, ffi, ffl, and the dipthongs.

Literals, or literal errors, are mistakes of the compositors in inserting wrong letters, or inverting right ones. The term is not applied to outs or doubles.

Lithography.—From "lithos," a stóne, and "graphein," to draw, is the art of printing from a peculiar kind of stone, in a manner resembling the more ordinary kinds of engraving. It was invented at Munich, in Bavaria, between the years 1795 and 1798, by Aloys Sennefelder, who, being too poor to pay for printing his works in the usual manner, by letter press, endeavoured to discover a method of writing his productions on various metals in a manner which would admit of copies being multiplied, as in engraving, to any extent. "He found," says the Encyclopædia Americana, "in the course of his "experiments, that a composition of soap, wax, and lamp black, "formed a good material for writing on his plates; that when dry "it became firm and solid, and that it resisted aquafortis. Wanting "facility for writing backwards on his plates, he got some pieces "of Kilheim stone, as a cheap material for practising on. One day "being desired by his mother to take an account of some linen about "to be washed, he wrote the particulars on the surface of a polished

" stone with his composition, intending to copy it at his leisure. Af-
" terwards, when about to efface the writing, it occurred to him that
" he might obtain impressions from it; and having eaten away the
" stone with acid for about the hundredth part of an inch, he found
" that he could charge the lines with printing ink, and take suc-
" cessive copies.

" This new mode of printing seemed to him very important, and he
" persevered through all difficulties in applying his discovery to prac-
" tical purposes. While experimenting he found that it was not neces-
" sary to have the letters raised above the surface of the stone, but
" that the chemical principles by which grease and water were kept
" from uniting were alone enough for his purpose. At this time
" lithography may be said to have been fully discovered. Some pieces
" of music were first printed for publication in 1796. The difficulty he
" had in writing backwards led to the process of transfers, and the
" use of dry soap led to the mode of chalk drawings.

" After considerable improvements, in 1799, Mr. Sennefelder ob-
" tained a patent privilege for Bavaria, and entered into partnership
" with Mr. André of Offenbach, who proposed to take out patents in
" London, Paris, and Vienna. In August 1800, Sennefelder went
" to Vienna, where extensive preparations were made for applying his
" process to print cottons; this however, turned out a failure, and he
" returned to Munich in 1806, where Mr. Mitterer, professor of draw-
" ing at the public school, practised lithography to multiply copies for
" the pupils, and is said to have invented, or much improved the
" chalk composition in its present form. From this period the practise
" of the art was improved and extended; from Munich it spread
" to Germany, and from thence to France and England."

The stone employed in Lithography is a species of limestone, resembling a smooth yellow hone in appearance. The best is procured from the quarries of Solenhofen, in Bavaria, but it is also found in France and England. Lithographic stones are also procurable in India in enormous quantities; at Kurnool, at Datchapillay on the banks of the Kistnah, and near Appiapilly, about 14 miles beyond Cuddapah. They vary very much in quality and thickness, according to the depth from which they are quarried. Those from Kurnool are the hardest, and are well suited for transfers; those from Datchapillay can be procured of almost any degree of hardness or softness, as the beds in some places are nearly twenty feet thick, and are some miles in extent. Any stone which effervesces with an acid, which

imbibes water with facility, and is easily penetrated by greasy substances, is fit for lithographic purposes; the nature and quality of the work requiring a stone of corresponding quality and fitness. The best for general purposes is that which breaks with a conchoidal fracture, is of a homogenous texture, a uniform yellowish white colour, and emits, when breathed upon, an aluminous or clayey odour. The prepared stones vary in thickness from one to four or five inches, the largest being necessarily the thickest, to endure the severe pressure to which they are subjected. Of whatever dimensions, they must be perfectly flat, and of uniform polish. To obtain this, they are rubbed with sifted sand or water till they obtain the necessary grain, or surface, if for chalk drawings; and if for ink drawings, they are polished with pumice stone till they are perfectly free from grain or scratches. Stones which have been printed from are polished afresh, to remove the old drawing, and in addition to the usual rubbing with sand and pumice stone, are washed with a mixture of aquafortis and water.

The drawings are either executed at once on the stone, or are taken from transfer paper. In the former case, the drawing is reversed, in the latter it is done in the natural order and is reversed when transferred to the stone. In either case the drawings are made by the pencil of chalk, or by ink and a fine pen or camel hair pencil. "To "render the lithographic process intelligible, let it be supposed that "the artist now completes a drawing with the chemical chalk upon a "grained stone. If, while in this state, a sponge filled with water "were passed over the face of the stone, the drawing would wash out, "the chalk with which it is made being soluble in water by reason of "the soap which it contains. Therefore, before it is capable of yielding "impressions, the drawing is washed with a weak solution of nitrous "acid, which neutralizes the alkali contained in the soap, and renders "it insoluble in water. After this, a solution of gum is floated over "the face of the stone, and when this is removed, if a sponge and "water is applied to its surface, as before supposed, the drawing is "found to be no longer removable, because the chalk with which it is "executed is now no longer soluble in water. In this state the work is "ready for the printer, who obtains impressions by the following "process:—Having with the ends of his fingers sprinkled a few drops "of water on the stone, and spread them with a sponge so as to wet, "or rather damp the whole surface, the printer finds that the water "has been imbibed by the stone only on those parts not occupied by "the drawing, which being greasy, repels the water and remains dry. "A roller properly covered with printing ink is now passed over the

"whole stone, which will not even be soiled where it is wet, from "the antipathy of oil and water; but the parts occupied by the water "being, as we have seen, dry and greasy, have an affinity for the "printing ink, which therefore passes from the roller and attaches "itself to the drawing. In this state it is said to be charged, or rolled "in. Damped paper is then put over it, and the whole being passed "through a press, the printing ink is transferred from the stone to "the paper, and this constitutes the impression. By repeating in this "manner the operations of damping the stone and rolling in the "drawing, an almost unlimited number of impressions may be ob-"tained. The modes of lithography are various, but the illustration "just given will explain the principle of them all. It consists in the "mutual antipathy of oil and water, and the affinity which the stone "has for both—that is, in its power of imbibing either with equal "avidity."—*Penny Cyclopædia.*

Great delicacy and dexterity are requisite in the practise of this art, as while drawing on the stone the slightest touch of the hand will fasten on the surface, and appear in the impression. Much care is also necessary in the working, for, from various causes great irregularities will at times occur in the colour. One of the chief of these disturbing causes is variation in temperature; and it is always prudent to make one or two trials before proceeding to regular work, as the stone and ink which in the morning worked well, may in the evening produce only intolerable blotches. Lithography can never equal good engraving, but, for all ordinary purposes it affords a ready substitute. Since its discovery it has gradually worked into favour, partly on account of its cheapness, and partly owing to the facility of operation and the numerous modes in which it may be applied. Cards and circulars, maps and plans, and excellent imitations of chalk drawings, are executed by lithography in a very superior style; so also are those fancy placards for shop windows, book covers, music-wrappers and illustrations, and the like, printed in various coloured inks, and heightened by gold and bronzes.

Lithographic Ink—is employed in making the drawings on stone, and varies in composition according to the nature of the work, and whether the drawing is made direct on the stone or is transferred to it from paper. One kind, of good quality, consists of dried tallow soap, mastic, sub-carbonate of potash, table varnish and lamp-black. The materials are incorporated in a close vessel over a fire, and when prepared are cast into moulds. This substance, when cold, forms a chalk which may be pointed like a pencil, or it may be dissolved in water to form an ink. The following recipe for making ink is

recommended by Hulmandel :—two ounces of tallow candle, two ounces of virgin wax, two ounces of shell lac, two ounces of common soap, and lamp black to bring it to the colour required. To be prepared and incorporated as the preceding.

As it is more difficult to work with chalks than with inks, greater care is required in the preparation of the former, hence the proportions of the mixture may be varied, so as to produce a mass sufficiently firm without being dry, and also without having a tendency to clog the stone. The ink used by the printer is generally composed of burnt oil or varnish, and lamp black, with a small proportion of indigo to bring up the colour.

Lithographic Press.—This press is of very simple construction. An iron frame supports a moveable table, as in the common press. The stone lies in a box on this table, and when properly inked, with a sheet of paper laid on it, is covered by a piece of leather and drawn under a hard edge or scraper, the impression being aided by a lever power. The edge of the scraper must be smooth and true, and the leather of one uniform thickness, so that the pressure may be equally distributed.

Locking up.—Tightening the quoins round a form with a mallet and shooting stick, so that it may be lifted and moved from the imposing stone without the furniture or types dropping out.

Long cross.—The thin iron bar which divides a chase the longest way.

Long Primer.—A type, one size larger than Bourgeois, and smaller than Small Pica ; there are 89 lines to a foot.

Low case.—A case from which nearly all the type has been composed.

Lower case.—The case in which all the small letters, points, spaces, and quadrats are kept; it is always placed on the lowest part of the frame next the workman, hence its name.

Lug.—A roller is said to lug when its surface is soft, and it sticks to the ink table, being removed with difficulty.

Lye.—A solution of alkali in water, used to wash the ink from forms after working. A very good lye is made by boiling together four measures of wood ashes and one measure of unslaked chunam in about 15 measures of water. A preparation known as Watson's detergent is very useful for cleaning forms.

Lye brush.—The brush used to wash a form with lye.

Lye trough.—A shallow square wooden trough, lined with lead, and its upper edge bound with iron, used to lay forms in to wash them.

M.

Machines—In a printing office, are the various presses and appliances for printing, and which may be worked by manual labour or driven by steam or any other motive power.

The earliest form of the printing press was nothing more than a common screw press with a contrivance for running the form under the screw after being inked. This mode of working must have been very laborious and very slow. As the screw must have come down upon the types with a dead pull, great care must have been required to prevent the pressure being so hard as to injure the face of the letters. Its defects were remedied by an ingenious Dutch mechanic, William Jansen Blaew, a mathematical instrument maker at Amsterdam. In the early part of his life this man was a joiner, but having served out his time, and being of an inquisitive disposition, he rambled to Denmark, where he entered into the service of Tycho Brahe, the astronomer. About 1620 he set up a printing house, where he soon found the inconveniences attending the structure of the old press. He was induced to contrive remedies for every inconvenience, and succeeded so well, that he made nine new presses for his own office. The improvements in Blaew's presses do not require to be particularly described; it may be sufficient to mention, that the head of the press in which the screw worked, as well as the bed of the table upon which the form of types rested, were yielding; and that the screw consisted of three or four worms, according to the size of the cylinder. In this way the pressure was rapidly communicated from the screw to the types; and the spring above and below gave a sharpness to the impression while it prevented it being too hard. Blaew's presses gradually drove out the more ancient press; but even as late as the year 1770, Luckombe, in his history of printing says, "There are two presses in use, the old and the new fashioned."

These presses remained in use till near the end of the 18th century, in spite of numerous defects, one, and not the least of which was, that the platten, or impression surface, was generally only half the size of the sheet, and so, after one portion of a form was pressed, the carriage had to be wound still further in, and the remaining portion pressed. The consequence of this was, that besides much loss of time, the impression on a sheet was not always uniform.

At length, about the close of the 18th century, the Earl of Stanhope, who had applied himself to the improvement of printing, invented a press which soon came into general use, to the exclusion of the old wooden presses, which are now almost unknown. His lordship's improvements did not go the length of altering the general form of the press. He left the same plan to be pursued of winding the carriage below the platten by a handle and rounce, and of pulling the impression by the application of the right hand to the seat of power; but he constructed the press of iron instead of wood, of a size to print the whole surface of a sheet, and applied such a combined action of levers to the screw, as to make the pull a great deal less laborious to the pressman.

The improvements of Lord Stanhope were speedily followed by the attempts of other individuals in great Britain and America to remedy the ancient defects in printing mechanism. So numerous, indeed, have been their attempts that it is not possible in the compass of this little work to do more than mention them, without going into details.

The first of these imaginary improvements was made by a German of the name of D'Eighn, and to his press he gave the name of the Sector. This was much like the Stanhope in formation, but did not meet with any great favour.

The field was next entered by a firm of the name of Cogger and Scott; their press was denominated the Cogger, but is seldom heard of in printing offices now.

Next came the Ruthven press, invented by an Edinburgh printer of that name. This is the only instance in which an improved press was made of quite a new construction; in all other presses the table on which the type is placed is moveable, but in this the types stand upon a fixed frame, while the pressing part, or platten, is brought over the form by being pulled forward on wheels. This was an exceedingly meritorious invention, and many presses were manufactured and sold; but experience has evinced that the contrivance is only valuable when applied to small presses.

Among those which have gained the largest share of approbation may be mentioned the Columbian press, which is of American origin. It was first introduced in England in 1818, by Mr. George Clymer of Philadelphia, and was immediately patented. The pressing power, in this instance, is procured by a long bar or handle acting upon a combination of exceedingly powerful levers. For ease and facility of pull this press is preferred by most workmen, and certainly the powerful command which can be exercised, is favourable to delicacy and exactness of printing.

With one or two exceptions, the modern improvers of the printing press have confined their efforts to the process of communicating pressure to the platten, so as to procure greater rapidity of working. Sometimes the power is procured by the action of two or more inclined planes working against each other; in other instances by fulcrums and levers; in others by the straightening of a joint. The latter is an exceedingly simple and beautiful form of power, resembling the bending and straightening of the knee-joint. This may be considered the most efficient mode of compressing the platten yet discovered, and it would be difficult to rival it in the properties of rapidity and simplicity of execution. Nevertheless such is the number and rapidity of improved presses in the present day, that it would not be easy to decide upon which has the best claims to the notice of printers.

Amongst the last named form of press we find the Russell, which is simple and easy to work, but as the platten is somewhat loose, it shifts now and then. The Smith press, the Washington press, and Otis-Tuft's press are varieties of the knee power, are very light, and easily worked.

Another excellent press, and one of the best invented, is Mr. Cope's Albion, which is at least equal to the Columbian in power, and more steady in the working.

The Imperial and the Hercules, are somewhat similar to the Albion, but do not seem to be thought so good.

All these are "machines," but I have not yet mentioned the "power presses" which are generally spoken of as machines in a printing office. For a long time in spite of the ingenuity of Lord Stanhope and his successors, the process could only be proceeded with at a considerable amount of fatigue, and at a rate of speed seldom exceeding 250 impressions per hour, or 125 sheets printed on both sides. It is evident that such a state of things was quite incompatible with the advancement of knowledge, and the necessity of producing a large number of impressions in a short space of time, particularly as regarded newspapers. It became apparent that a complete revolution was necessary in the art of printing; that flat surfaces should be discarded, and cylinders brought into use. It is now necessary to describe how this great modern invention, applied to printing machines, came to be adopted.

Mr. William Nicholson, editor of the Philosophical Journal, was the first person to publish a project for a self-acting printing press. He obtained a patent in 1790-91, for imposing types on a cylindrical surface; but though the principle undoubtedly was ingenious, he failed in his attempts.

In 1804 Mr. Kœnig, a clock-maker from Saxony, failing to obtain support from the continental printers, went to London, and in 1811 obtained a patent for working the common hand-press with power; but after much expence he renounced this project. He then turned his thoughts to using a cylinder for communicating pressure, this was a success, and on the 28th November 1814, the "Times" was first printed by steam impelled machinery. In this machine the two principle features of Nicholson's invention were embraced; the cylinder and the inking rollers.

After the utility of cylindrical printing had been thus proved, it was thought highly desirable to apply the principle to book-work, in which accurate register was indispensable. This was attained, to a certain extent, by using two cylinders, the sheet of paper being conveyed from the bottom of the first cylinder to the second, round which the sheet was carried till the second side was printed.

So firm was the belief of the patentees (Mr. Kœnig, Mr. Bensly, and Mr. R. Taylor) that perfection had been reached, that in March 1817, they issued a prospectus, offering three kinds of machines at high prices, and requiring a considerable annual premium.

About this time Donkin and Bacon set up a beautiful machine for Cambridge University; an excellent specimen of contrivance, but too complicated for common workmen.

In 1818 Mr. Napier took out a patent for improvements in printing machinery; and another patent was taken out by Messrs. Applegath and Cowper. Mr. Napier's invention consisted principally in using grippers, or metal fingers, instead of tapes, for seizing hold of and leading the sheet of paper round the cylinder. His machine, however, did not meet with the general estimation of that of Applegath and Cowper, whose patent referred principally to the application of two drums placed between the cylinders to insure accuracy of register. Machines of this construction were made for all the principal printing establishments in London, Paris, Edinburgh, and many other cities; and it is nearly upon their model that many machines are now constructed by other manufacturers.

While these improvements were being made, the advantage of securing types or plates upon the cylinder occupied much attention. Nicholson sought to effect this by giving the shank of the type a shape like the keystone of an arch; Donkin and Bacon by attaching types to the sides of a revolving prism; and Cowper, more successfully, and for which he obtained a patent, by curving the stereotype plate, and thus fixing it on the cylinder in a perfectly secure manner. Many power

presses are made on this plan, and the following description of one erected by Mr. Applegath in the great Exhibition building in 1851, and which was used to print the Illustrated London News, will give an idea of the general principle upon which many of them are constructed.

The chief novelties of the Applegath vertical printing machine are, first, the type being placed around a large cylinder, placed vertically, thus leaving impressions on several sheets of paper at each revolution, and second, that by such arrangement a far greater number of copies can be produced within a given time than by any reciprocating machine as yet invented.

As this machine is calculated to throw off four impressions for each revolution of the cylinder, it is necessary to introduce as many sheets of blank paper at the same time. This is done by the "layer on," who draws a sheet towards the upper rollers, when a small iron spindle furnished with brass pulleys, revolving at considerable velocity, descends upon it, causing it to pass between the sets of vertical tapes, which carry it down to a point at which its course is altered by narrow upright pieces of wood, called "stoppers," which advance and compress the sheet of paper between them, the vertical tapes at the same time receding from the paper. In the next place, the stoppers recede, and the paper is momentarily suspended between small pulleys, mounted on delicate springs, called "finger rollers." The sheet is now impelled towards the impressing cylinder by means of vertical rollers in rapid motion on either side of the sheet, which is secured by the ordinary marginal tapes, and, passing round the impressing cylinder, receives an impression from the type fixed on the great vertical cylinder. The sheet, thus printed, passes towards the "taking off" table, being supported in its progress by the upper pair of tapes, which are stopped at the proper time, leaving the sheet suspended between small spring pulleys above it, until the "taker-off" removes it to the table.

The type cylinder, which is really the great feature of the invention, consists of three strong circular rings of cast iron, securely keyed to an upright spindle. The segmental chases which contain the type and wood-cuts, are attached to the circular rings by screws.

During the revolution of the type cylinder, it comes in contact with four printing cylinders, each of which is exactly one fourth of its diameter. The printing cylinders work into the type cylinder by means of toothed wheels placed beneath them.

The surface of the impressing cylinders is made partly of fine woollen cloth, and partly of paper, or firm card board, reduced in

those parts requiring the over laying, by cutting or scraping, according to the thickness required. The ink is carefully spread over a circular invert opposite to the type, and connected to the vertical spindle of the type cylinder by hinged arms resting on an upright bar, which is terminated by a pulley. This pulley acts upon a circular undulating railway fixed below the type cylinder, and from which the distributing surface receives a slight up and down motion as it revolves. The distributing surface is fed with ink by means of vibratory rollers, which continue in action between it and the upright ink boxes placed under the copper reservoirs.

The contact of the inking rollers with the type is regulated by long coiled springs connected with the bearings, so that they merely touch the surface of the letters, which is one of the great advantages of the vertical portion of the machine. To shew the advantage of the arrangement, it is only necessary to mention, that in the case of the Times machine, 40,000 impressions have been taken without any difference being discovered between the first and the last. Another advantage of the vertical machine is that the dust or small particles adhering to the paper are taken from it when suddenly stopped, and fall to the floor, instead of being deposited upon the form or distributing table, as in the case of horizontal machines.

In the London "Times" printing office is another vertical machine which was erected by Messrs. Little and Applegath, from designs of the former gentleman. The drum, or cylinder of this machine is 64 inches in diameter, and to it the columns of type are fixed. The "forms" are made segments of its surface, just as a tower of brick may be faced with stone. The type is fixed to the surface of the drum chiefly by means of the column rules, long strips of brass dividing the columns of the page. In this instance they are so screwed to the sides of the iron frame as to become powerful tension ties; and being made with a wedge-like section, that is thicker towards the outer surface of the type, they keep it in its place, like the key stone of an arch. This drum is surrounded by eight cylinders, also placed with their axes vertically, upon which the paper is carried by tapes in the usual manner.

Thus in every revolution of the drum, the form is successively pressed against each of the eight cylinders, and each of the eight being supplied with paper, eight sheets will be printed in one revolution. This machine will print about 12,000 copies per hour. There is no doubt that the vertical position of the inking rollers is conducive to the goodness of the work, for the type and engravings are only

touched on their extreme surface. 50,000 impressions have been taken without it being found necessary to stop to brush over the form or table.

One of the fastest machines in use is the "Lightning Press," invented and manufactured by Colonel Hoe, of New York. A horizontal cylinder of about four and a-half feet in diameter, is mounted on a shaft, with appropriate bearings; about one-fourth of the circumference of this cylinder constitutes the bed of the press, which is adapted to receive the form of types, the remainder is used as a cylindrical distributing table. The diameter of the cylinder is less than that of the form of types, in order that the distributing portion of it may pass the impression cylinders without touching. The ink is contained in a fountain placed beneath the large cylinder, from which it is taken by a duct or roller, and transferred by a vibrating distributing roller, to the cylindrical distributing table ; the fountain roller receives a slow and continuous rotary motion, to carry up the ink from the fountain.

The large cylinder being put in motion, the form of types thereon is in succession carried to eight corresponding horizontal impression cylinders, arranged at proper distances around it, which give the impression to eight sheets, introduced one at each impression cylinder. For each impression cylinder there are two inking rollers, which vibrate on the distributing surface while taking a supply of ink, and at the proper time pass over the form, when they again fall to the distributing surface. Each page is locked up upon a detached segment of the large cylinder, called by the compositors a turtle, and this constitutes the bed and chase. The column rules run parallel with the shafts of the cylinder, and are consequently straight; while the head, advertising and dash rules, are in the form of segments of a circle. A cross section of the column rules would present the form of a wedge, with the small end pointing to the centre of the cylinder, so as to bend the types near the top. These wedge-shaped column rules are held down to the bed, or turtle, by tongues, projecting at intervals along their length and sliding in rebated grooves cut crosswise in the face of the bed; the space in the grooves between the column rules is filled with sliding blocks of metal accurately fitted, the outer surface level with the surface of the bed, the ends next the column rules being cut away underneath to receive a projection on the sides of the tongues, and screws at the end and side of each page to lock them together. The types are as secure on this cylinder as they can

be on the old flat bed. This machine is capable of printing 20,000 impressions per hour. Eight persons are required to feed in the sheets, which are thrown out and laid in heaps by self-acting flyers.

Similar machines with six impression cylinders only, capable of printing 15,000 impressions per hour, and others with four impression cylinders, capable of printing 10,000 impressions per hour, are manufactured by this firm.

The names of many other machines will be found in their proper alphabetical order.

Macule.—To slur or double the impression in printing. It is generally caused by the joints of the tympan or head being loose.

Make.—In casting off copy it is usual to say it will make so much; as, it will make seven pages ; a sheet, &c.

Making ready.—Placing a form on the press, and preparing it for striking off. This term includes laying on the form, fixing it in its place, placing the tympan sheet on the tympan, fixing the points to make register when both sides have to be printed, making register, preparing frisket, and giving an equal pressure and producing an even colour on all the pages. It also denotes the overlaying and bringing up of engravings in wood, where such are introduced, so as to give them the proper effect of light and shade.

In ordinary work, where despatch in printing is of primary importance and appearance a secondary consideration, thick blankets are used in the tympans ; and when old type is used they are also necessary to bring up the rounded face of the letter. But it is impossible to produce " fine" work with too much blanket.

Before a form is laid on, the pressman must carefully wipe down the table of the press, for if any hard particle, though ever so small, remain, it will raise that part of the form, cause the impression to be hard, and probably injure the tympans. The back of the form should also be dusted before laying it on the press. The form must be laid on the table so as to fall in the centre of the platten, and be quoined up to fix it in that position. A sheet of paper must now be folded according to the position of the crosses of the chase, which form a guide for placing it in the centre of the form. If a form of 8vo. or 4to. the sheet should be folded exactly in the centre each way ; but if of 12mo. so as to fall properly in the off-cut. The sheet being laid upon the form, the tympans, slightly damped, are turned down upon the sheet, which when pulled will adhere to them. Should it happen to have been laid uneven, alter it till quite correct, as it is to serve as a

guide in laying all the sheets of the white paper form. The points must now be selected, and so placed on the tympan that the spurs make the point holes within the grasp of the right hand thumb and fore finger, because when the reiteration is working it will be more easy to print the sheet when laying it on the tympan. The points should not be placed too near the edge of the paper, because in working the reiteration there will be a great loss of time if the pressman has to reach to the further side of the tympan to point his sheet. This is of importance in a long number, as being able to lay the sheets quickly on the points adds much to the rapidity with which the pressman will strike off his form. Also the less distance between the points the better, because, if wide apart, the pressman must draw his body back to put the sheet on the near point.

After the compositor has corrected his "press revise," the pressman must examine the form to see that it is properly locked up and planed down, and that no letters or spaces be in the white lines, on the furniture, or between the lines on the leads. If any thing is left it will be moved by the roller, and will most likely batter the form.

When a press has a run upon the same work, with the same sized chases, the forms may be lifted when struck off without moving the furniture from the far side and head of the press table; the next form can be laid to this furniture, and register be made with little trouble.

The frisket, covered with stout paper, is pulled lightly on the form, then taken off the tympan, and the pages cut round with a pair of scissors or a sharp knife, about a nonpareil from the edge of the margin of each page, and replaced on the tympan. It is advisable in forms with a number of pages, to put a few cords across the frisket, to strengthen the bars of paper. At times it is necessary to work with cords only, when the margin is very narrow.

If any white, or short pages occur in a form, the frisket is left whole to cover the blank space; but if it is an old frisket, and that page is already cut out, the pressman may paste a piece of paper over to prevent it blacking. A bearer should also be put on to prevent the impression being too hard on the edges of the neighbouring pages. Cork bearers, or hard paper rolled up and pasted, and called spring bearers, are very serviceable.

Before striking, the pressman must examine the frisket to see if it bites, that is, if it takes the impression of any of the edges of the pages. If it does, the parts must be cut away.

The paper bank should be placed at an angle of 75 degrees, more or less, with the near side of the carriage. The reason is, if the near side of the bank stands at right angles with the near side of the carriage, the pressman has to move from his place to lay, or cast sheets, and by placing it at the before mentioned angle, the baller has a better opportunity of looking over the printed sheets, which he must do frequently, to see if he keeps the colour of his work correct.

The heap must be placed on the horse, at the near end of the bank, as near the tympan as possible without touching it, so that the sheet has merely to be drawn over the edge of the tympan to be laid on. If the wet sheets stick to each other from being pressed, they must be shaken sideways and longways till loose enough. The pressman should rub the nail of his right hand thumb gently across the upper sheet to get the edge beyond the heap, so that he may lay hold of it easily; two or three sheets will gradually follow in a fan shape.

The following directions for making ready are by a practical man, a pressman; and though rather old, will apply to printing at any time.

" Lay the form on the table centrically under the platten; quoin it all round; fold the tympan sheet according to the form laid on the press; lay it even on the form, and stretch it as much as it will bear; pull it, for the purpose of attaching it to the tympan; paste it all round to the tympan, at the same time keep stretching it; screw on the points; make them fall in the channel of the short cross; make good register with white paper, whether the form be whole or half sheet work.

" This is one of the good old customs, and the best that I know of; because the pressman is sure to have the points centrical; he perceives whether all the furniture be put in right or wrong, even to a single scaleboard in leaded matter, which should be line upon line, he ascertains whether the form be locked up evenly or not, and whether the leads be all put in right; also, whether the pages that begin chapters, or other divisions of the work, have the proper whites; he can likewise discover if any of the pages be made up too long, or too short; any of these errors, that may have occurred, must be amended in the white paper form, otherwise the reiteration will have the same faults, in order to make register. On fine work, I make ready the white paper form of a sheet in the same manner as I do a half sheet, on purpose to discover those errors, by which process I gain more time in making ready the reiteration or second form than I lost in the white paper form.

" For fine work, use the finest cloth that can be procured, and not thick flannel blanket : if the form be light, one thin cloth blanket will be sufficient ; and if it be very light, that is to say open leaded matter, sheets of paper are preferable to either flannel or cloth in the tympans. Be sure to have one sheet of stout paper, which will cover all the parchment in the inside of the outer tympan. Pull a dry even sheet of paper ; look carefully on the back of the impression ; if it be not equally even, the light parts must be overlaid with tissue paper, or India paper ; if some parts be very heavy, cut or tear out the heavy parts. The overlays should be pasted only slightly on the impression sheet, in case any of them should have to be taken off ; paste the four corners of this sheet upon the thick sheet ; let the overlays be uppermost, that you may see them ; then pull another impression sheet, with the first in the tympans, and if the impression still be not even, overlay the first impression sheet again ; and continue pulling impression sheets, and overlaying the first impression sheet, until you have an even and regular impression on all parts.

"As you go on with the form, if any of the overlays require to be taken off, do so ; if bits are required to be taken out, or rubbed off the tympan sheet, it must be done. In some works the outer tympan cannot be too dry, but the pressman must be the judge of this, according to the work he has to do.

" Having a good black ink well brayed on the surface of the ink block, he takes a small quantity and distributes it well ; he takes time to roll the form well and carefully, and then pulls a sheet of the right paper, dwells on the pull a short time in order to make the paper take the ink clean off the types, and look a clear black upon the paper. The impression must not be too deep, as nothing must appear but the shape of the face of good types. If the impression be too deep, or too much ink on the form, more than the real shape will appear, and the work will not be fine ; but if the work be fine, he goes on gently and regularly until the white paper be off. He then lays on the reiteration form ; and having the overlays ready that he made before, he has very little trouble in making it ready : he makes such good register, that line falls upon line. After the reiteration is off, if he does not go on with the same work, or work of a similar size and imposition, he carefully puts by the tympan blankets, cloths, or tympan paper and overlays, till they are again wanted for the same work. All other works must have their own overlays made purposely for them.

"After the first overlays are made for their respective works, there is not so much trouble in making ready the future sheets of the same work as they are put to press; indeed, if the pressman carefully preserves his overlays, tympan paper, or cloths, he seldom has occasion to do more than alter a few of the overlays, as the paper sometimes varies in thickness, which may want a few overlays on the tympan sheet. India paper is the best for this, as it is of a soft and pliable nature, and as it lies on the tympan sheet the pressman can easily perceive if one part of it has a deeper impression than another.

"It is to be observed, that fine work cannot be made upon bad paper, or with old worn types."

Making register.—So locking up a form on the press that the pages and lines will fall exactly on the back of each other when perfected.

Make up.—To form matter which has been set at random (in continuous slips) into pages. This is done at the commencement of a work by measuring the length of a solid page with the proper number of lines, and marking it by a notch cut in a piece of reglet, so that afterwards the lines need not be counted, but may be measured by the "guage," and so whited as to make them fall of the proper length. When many heads occur in a book it is advisable to mark the whites on the guage also, as by this means they may all be made up to fall alike.

Mallet.—A wooden hammer with which the quoins are driven in locking up or unlocking a form, or for any other purpose.

Margin.—The blank, or white paper round a page or form.

Marginal Notes.—Notes at the outer edge of the page, running from top to bottom, or placed opposite the matter to which they refer. They are usually termed side notes by printers.

Matter.—The type composed for any work.

Measure.—The width of a page or column.

Medhurst's Press.—A press of great simplicity of construction, the invention of Mr. Medhurst, of London; they are seldom to be found in use.

Metal.—The technical name of a mixture of metals, properly so called, with which types and stereotype plates are cast. Lead and regulus of antimony, melted together in different proportions, form the metal in general use; but of late years tin has been added to increase the hardness, and type cast with this is known as patent hard metal type. For ordinary metal the proportion of eighty pounds of lead to twenty pounds of regulus is used for large types, and seventy-

five pounds of lead to twenty-five of regulus for small type, which should be the hardest; but most type founders vary a little. In stereotype metal the proportion of regulus is not so large; say fifteen of regulus to eighty-five of lead; and leads are even generally softer.

Metal Rules.—Straight lines caste type high, of widths varying from one *em* to four *ems*. They are generally used for transverse lines in table work, for blanks where names are omitted, or where the same name or article is repeated in lines immediately under each other. They should have as fine a face as brass rule, and be cast in the centre of the type.

Millboard cutter.—An iron table with moveable guage, and large knife affixed to one end, used for cutting boards to the sizes required by binders.

Minion.—A type one size larger than Nonpariel, and one smaller than Brevier. There are 128 lines to a foot.

Mitreing Guard.—A small instrument used to bevel the ends of brass rules, borders to pages, &c., so as to make them fit each other exactly.

Monk.—A blotch occurring in a sheet through the ink not being properly distributed, and so leaving too much in one place on the form.

Morgan's Patent Cutting Machine.—An improvement on Wilson's Guillotine Machine. The general appearance is similar to it, but the action of the machine is continuous, that is, the knife, when the paper or book is cut through ascends again without reversing the motion of the handle. The cut is diagonal instead of direct, therefore so much pressure is not required. The knife will return in one-fourth of the time taken for its descent.

Music Type.—Type used for printing music.

N.

Naked Form.—Is when the furniture is taken from all sides, and the matter is left standing alone.

Near side.—That side of the press on which the pressman stands to pull and roll.

News house.—An office in which newspapers only are printed.

Nick.—A groove cut crossways on the shank of types, to make a distinction between different founts, and to enable the compositor to see quickly which is the underside of the type he is about to pick up.

Nonpariel.—A type, one size larger than Pearl, and one size smaller than Minion. There are 143 lines to a foot.

Numeral.—Relating to numbers. The numeral letters are the seven Roman capitals, I, V, X, L, C, D, M; the numeral figures, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0.

O.

Obelisk.—Marked thus †, is used as a reference to notes at foot or in the margin of the page. It is called a dagger by printers.

Octavo.—A sheet of paper folded into eight leaves or sixteen pages. Usually written 8vo.

Odd page—A page having an uneven number as its folio.

Off-side.—The side of the press opposite to that on which the pressman stands to pull.

Off-cut.—That part of a printed sheet (in 18mo or 12mo), which is cut off, and when folded is inserted in the middle of the other part.

Old English.—Black letter, or modern Gothic.

Open matter.—Matter full of breaks or whites, poetry.

Orthography.—Derived from two Greek words, 'orthos' and 'graphein,' which mean to write correctly, is that part of Grammar which treats of the forms and sounds of letters, and the correct method of spelling words.

The orthography of the English language is attended with much uncertainty and perplexity, but a considerable part of the inconvenience may be remedied by attending to the general laws of formation; and for this end the reader is presented with the following maxims.

Rule I.—Monosyllables ending with f, l, or s, preceded by a single vowel, double the final consonant; as staff, mill, pass, &c. The only exceptions are, of, if, as, is, has, was, yes, his, this, us, and thus.

Rule II.—Monosyllables ending with any consonant but f, l, or s, and preceded by a single vowel, never double the final consonant; excepting only, add, ebb, but, egg, odd, err, inn, hum, purr, and buzz.

Rule III.—Words ending with y, preceded by a consonant, form the plural of nouns, the persons of verbs, verbal nouns, past participles

comparatives, and superlatives, by changing y into i, as, spy, spies; I carry, thou carriest; he carrieth or carries; carrier, carried; happy happier, happiest.

The present participle in ing, retains the y, that i may not be doubled; as, carry, carrying; bury, burying, &c.

But y, preceded by a vowel, in such instances as the above, is not changed; as, boy, boys; I cloy, he cloys, cloyed, &c; except in lay, pay, and say; from which are formed, laid, paid, and said; and their compounds, unlaid, unpaid, unsaid, &c.

Rule IV.—Words ending with y, preceded by a consonant, upon assuming an additional syllable beginning with a consonant, commonly change y into i; as, happy, happily, happiness. But when y is preceded by a vowel, it is very rarely changed in the additional syllable; as, coy, coyly; boy, boyish, boyhood; annoy, annoyed, annoyance; joy, joyless, joyful, &c.

Rule V.—Monosyllables and words accented on the last syllable, ending with a single consonant preceded by a single vowel, double that consonant, when they take another syllable beginning with a vowel: as wit, witty; thin, thinnish; to abet, an abettor; to begin, a beginner.

But if a diphthong precedes, or the accent is on the preceding syllable, the consonant remains single: as, to toil, toiling; to offer, an offering; maid, maiden, &c.

Rule VI.—Words ending with any double letter but l, and taking ness, less, ly or ful, after them, preserve the letter double: as, harmlessness, carelessness, carelessly, stiffly, successful, distressful, &c. But those words which end with double l, and ness, less, ly or ful, after them, generally omit one l, as fulness, skilless, fully, skilful, &c.

Rule VII.—Ness, less, ly and ful, added to words ending with silent e, do not cut it off: as, paleness, guileless, closely, peaceful; except in a few words: as, duly, truly, awful.

Rule VIII.—Ment, added to words ending with silent e, generally preserves the e from elision: as, abatement, chastisement, incitement, &c. The words judgment, abridgment, acknowledgment, are deviations from the rule.

Like other terminations it changes y into i, when preceded by a consonant: as accompany, accompaniment; merry, merriment.

Rule IX.—Able and ible, when incorporated into words ending with silent e, almost always cut it off: as blame, blamable; cure,

curable; sense, sensible, &c. ; but if c or g soft comes before e, in the original word, the e is then preserved in words compounded with able; as change, changeable; peace, peaceable, &c.

Rule X.—When ing or ish is added to words ending with silent e, the e is almost universally omitted : as place, placing; lodge, lodging; slave, slavish; prude, prudish.

Rule XI.—Words taken into composition, often drop those letters which were superfluous in their simples; as handful, withal; also chilblain, foretel.

The orthography of a great number of English words, is far from being uniform, even amongst writers of distinction. Thus, honor and honour, inquire and enquire, negotiate and negociate, control and controul, expense and expence, allege and alledge, surprise and surprize, abridgment and abridgement, and many other orthographical variations are to be met with in the best modern publications. Some authority for deciding differences of this nature appears to be necessary; and where can we find one of equal pretensions with Dr. Johnson's Dictionary? though a few of his decisions do not appear to be warranted by the principles of etymology and analogy, the stable foundations of his improvement.—"As the weight of truth and reason," says Nares in his 'Elements of Orthography,' "is irresistible, Dr. Johnson's Dictionary has nearly fixed the external form of our language. Indeed, so convenient is it to have one acknowledged standard to recur to; so much preferable, in matters of this nature, is a trifling degree of irregularity, to a continual change, and fruitless pursuit of unattainable perfection; that it is earnestly to be hoped, that no other will henceforth, on light grounds, be tempted to innovate."

The plural number of nouns is generally formed by adding s to the singular : as, dove, doves; face, faces; thought, thoughts. But when the substantive singular ends in x, ch soft, sh, ss, or s, we add es in the plural : as box, boxes; church, churches; lash, lashes; kiss, kisses; rebus, rebusses. If the singular ends in ch hard, the plural is formed by adding s; as monarch, monarchs; distich, distichs.

Nouns which end in o, have sometimes es added to the plural; as cargo, echo, hero, negro, manifesto, potato, volcano, wo : and sometimes only s; as folio, grotto, junto, nuncio, portico, punctilio, tyro.

Nounds ending in f, or fe, are rendered plural by the change of those terminations into ves : as, loaf, loaves : half, halves; wife, wives; except grief, relief, reproof, and several others, which form the plural by the addition of s. Those which end in ff, have the regular plural : as, ruff, ruffs; except staff, staves.

Nouns which have y in the singular, with no other vowel in the same syllable, change it into ies in the plural: as beauty, beauties; fly, flies. But the y is not changed when there is another vowel in the syllable: as key, keys; delay, delays; attorney, attorneys.

Some nouns become plural by changing the a of the singular into e: as man, men; woman, women; alderman, aldermen. The words, ox, and child, form oxen and children: brother, makes either brothers, or brethren. Sometimes the diphthong oo is changed into ee in the plural: as foot, feet; goose, geese; tooth, teeth. Louse and mouse make lice and mice. Penny makes pence, or pennies, when the coin is meant; die, dyes (for play); die, dies (for coining).

Out.—An omission of a word, a line, sentence, paragraph, or leaf of copy.

Outer Form.—The form that has the signature page of the sheet.

Out of copy.—When all the copy the compositor has in his possession is composed, he is said to be out of copy.

Out of Letter.—When all the type is set from a case.

Out of Register.—When all the pages do not back correctly on each other.

Overlays.—Pieces of paper pasted on the tympans, or on a sheet between the tympans, to make the impression on all parts of the form even.

Overrun.—To take matter from one page to another, or from one line to another. The first is called overrunning pages, the second overrunning matter. Matter should never be overrun on the stone, as it is hardly possible to space correctly unless the matter is in the composing stick.

Overseer.—The manager, or superintendent of a printing office; the person to whom the whole internal management is confided. In every case it is necessary that he should be a good practical printer, and a man of prudence, foresight, and regular habits. In a business like that of printing, in which the labour of one department is immediately dependent on the regularity observed in another; in which the delay of compositors renders the machine or press idle, and a misarrangement in working off the forms keeps the compositor unemployed for want of type; in which, by wrong management the reader may at one time have nothing to do, and at another time be unable to get through his work as it is wanted, the situation of overseer is of much importance. It requires much skill, thought, and knowledge, to be able so to order the various departments, that each may facilitate the progress

of the others; and the constant endeavour of a good overseer will be to produce the greatest possible amount of work with the fewest possible number of hands. He should be constantly attentive and indefatigably industrious; and should see that every one under him is attentive, and performs properly his appointed duties.

P.

Page cord.—Small twine used to temporarily secure pages.

Paging Machine.—A beautiful little instrument used for paging ledgers or account books, numbering cheques, &c. A train of wheels, with raised numbers on their edges, are so affixed to an axle as to revolve in a certain number of movements of the handle, or lever of the machine. When the lever is pressed down one of the numbers first comes into contact with the inking roller, and then with the paper; and on being raised again the wheels are moved round a small space, and a new number presented for the next impression. These wheels are so arranged that one, the unit wheel, completes its revolution in ten impressions; the next, or tens wheel, in 100 impressions or movements; the 3d, or hundreds wheel, in 1,000 impressions, and so on. By means of a lever and two small screws, the rack and cog wheels can be so arranged as to print successive, alternate, or double numbers, that is, from 1 to 100,000 —— 2, 4, 6, 8, 10, &c.—— or 1-1, 2-2, 3-3, 4-4, and so on. The machine, though small, is too complicated to describe without the aid of a diagram.

Pale colour.—A term used to denote a deficiency of ink on the printed sheets.

Pamphlet.—Amongst printers, a work not exceeding 80 pages of 8vo. in extent.

Paper.—A thin, flexible substance, used for printing or writing purposes, either prepared from rags, or a few other fibrous substances.

Next to the invention of printing, there is not, perhaps, a more valuable or important discovery than that of the fabrication of paper from rags. Indeed, but for this discovery, printing would have been almost useless, as books on parchment or vellum would only have been within the reach of the rich.

The substitutes for paper amongst the nations of antiquity were the prepared skins of animals, and the inner bark of trees; while, for public records, and for edicts, tables of stone or brass were commonly

employed. There was also a species of paper manufactured by the Egyptians from the papyrus, or paper reed, a plant growing freely on the banks of the Nile. The inner bark of the stem was the portion used in making paper, and was prepared for writing on by a long and troublesome process. There is also still existing amongst the Chinese a manufacture of paper, peculiar to themselves, from the bark of a tree, which is probably of very early date.

It was some time during the twelfth century that an invention became known in Europe which soon superseded the ordinary writing materials then in use, and also formed an important step towards our present manufacture; this was the making of paper from cotton, at first the raw cotton itself, afterwards of worn out cotton cloth. This paper was of Eastern invention, and was first introduced into Europe by the Arabs, who established a manufactory in Spain. Cotton paper became generally known about the end of the twelfth and beginning of the thirteenth centuries, but in the fourteenth century it was almost entirely superseded by paper made from linen rags. It is not known when linen was first used as a material for making paper, nor to what country the honour of the invention is due. It was most probably discovered by accident. There are English M.S.S. on linen paper of as early a date as 1340, but it is generally believed that the manufacture was not introduced into England till the year 1588, when a paper mill was erected at Dartford, in Kent; but since that time the manufacture has steadily progressed.

There is not room, in the compass of this volume, to enter into a complete history of paper making, or to give more than the following concise account of the process.

The building in which paper is made is known as a paper mill; and as abundance of pure water is requisite in the manufacture, it is generally situated on the banks of a considerable stream.

The rags used are collected in large quantities in England, but a large supply is also obtained from Germany, Sicily, Italy and Hungary.

When the rags are taken to the mill, the first process is to sort them according to quality. This is done by women. They are then sent to the rag-house, where another set of women, called cutters, receive them. Each of these women stands at a table, the upper surface of which consists of iron wire cloth, beneath which is a drawer; a knife is fixed in the centre of this table, in a vertical position; the woman stands with the back of the blade opposite to her, while on her right hand is a large wooden box with many divisions. She examines the rags, opens seams, removes dirt, pins, needles, buttons,

or other substances which might injure the machinery, or damage the quality of the paper, and then cuts them into pieces not exceeding four inches square, by drawing them across the edge of the knife, and throws them into the different divisions of the box according to their quality. The wire cloth top of the table allows much of the impurities to pass through into the drawer, which is occasionally cleaned out.

After this process the rags again undergo a severe scrutiny, to make sure that no extraneous matter or hard substance which might spoil the beauty of the paper, remains in them.

The next process is to place the rags in the dusting frame, a large cylinder covered with iron wire cloth. On the axis of the interior are a number of spokes, each about a foot long, fixed transversely, which pass through the rags when the machine revolves, and shake out the particles of dust which may adhere to them.

The rags are next more or less boiled in an alkaline ley, to get rid of the remaining dirt and some of the colouring matter. The ley is composed of about seven pounds of carbonate of soda, with two and a half pounds of quicklime, to the hundred weight of rags. In this they are boiled about eight hours, and allowed to cool gradually. When removed from the boiler they are conveyed to the engine house to be reduced to pulp. This is one of the most important processes.

The vats for washing and grinding the rags are of an oblong form, rounded at the corners. They are made of strong wood, lined with lead or copper, or are constructed wholly of cast iron. Each vat will hold about a hundred weight of rags. There is a partition down the middle, in the direction of its length, but not quite reaching either end, which is also covered with metal sheeting. The cylinder, which washes or grinds the rags, is fixed firmly on a shaft extending across the vat, and is made to revolve by means of a pinion at its extremity. It is about two feet long, and two feet in diameter; and is technically called the *roll*. Round the circumference are fixed bars of steel, parallel to its axis. Below the roll is a block of wood, the upper surface of which follows the curvature of the cylinder, and is provided with a number of teeth, so adjusted as to present a series of cutting edges to the teeth of the cylinder: these two sets of teeth are not in contact, but may be brought near together or removed to a distance by adjusting the height of the roll.

The machine is supplied with water from a cistern at hand, which is furnished with a strainer of hair or wire to prevent impurities from entering. When properly filled with rags and water, the *roll* of the machine is set in motion, at its greatest distance from the plate.

The rapid progress of the teeth through the water causes a current, and the rags are drawn between the teeth of the roll and of the plate (or block of wood before mentioned), then thrown over a rise in the machine, and afterwards descends over a gradual declivity to the rough bottom of the vat. The whole mixture is by this means kept continually revolving; the roll is lowered gradually nearer to the plate, and the rags are first thoroughly cleansed, then cut, torn, and chopped to pieces, until they are at last reduced to a uniform pulp.

The first action of this machine being to wash the rags thoroughly, it is necessary to get rid of the dirty water, sand, &c., before the rags are reduced to pulp. For this purpose the engine is provided with a false perforated bottom, communicating with a tap, which is left open during the first half hour of the washing, and as a stream of clear water is constantly flowing through, all extraneous matters are thus strained off. During the time the tap remains open, the machine consumes about sixty gallons of water per minute, after which a much less quantity is required, in consequence of the rags becoming pulpy, and occupying more space. The action of the cylinder upon the rags is so violent, that both water and rags would be thrown out, if left uncovered; an inverted wooden box is therefore placed with one side resting on the edge of the machine, and the other on the central division covering the cylinder, and this arrangement prevents the rags being driven over. During the latter part of the process, the water which passes through the wire cloth does not amount to one-twentieth part of the quantity required at first. After beating for three or four hours the rags have parted with all their impurities, and assumed a somewhat pulpy consistency; in this state they are called stuff. When the operation is complete, a valve is opened in the bottom of the machine, and the stuff allowed to flow down a pipe into a draining chest, and left for a time for the water to flow off. After standing a time, if the pulp is made from coloured rags, it is bleached by the effects of the gas chlorine.

To effect this the stuff is placed in chests, and to about one-hundred weight of stuff is added from six to eight pounds of chloride of lime dissolved in water. The stuff is stirred frequently, that all may be exposed to the light and air alike; and after standing about twenty-four hours the liquor is drained off, and the stuff removed to an hydraulic press, where whatever is left of the solution is pressed out, and allowed to flow into tanks. After this the stuff is again washed, as it is necessary to remove every particle of the chloride of lime; in this state it is called half stuff, as being midway between rags and paper. It is now sent to the beating engine, which has a greater

number of teeth than the first, and is driven at a greater velocity. Here it is beaten about five hours, until the stuff becomes tolerably warm from the continued friction, and as it were combed into short fibres, when it is ready to be made into paper.

For the finer descriptions of writing paper, and where it is desired to preserve the water mark, paper still continues to be made in single sheets. The process consists in receiving the pulp into moulds, then getting rid of the water, and by pressing and sizing, and other operations, producing the smooth and beautiful surface which we recognise in a sheet of writing paper.

The pulp having been properly prepared is placed in a vat of stone about six feet square and four deep, where, to prevent it from settling, it is kept constantly stirred by a little revolving wheel called a hog. Means are employed to keep the pulp warm.

The moulds used are of two kinds, laid and wove. A laid mould consists of a frame of mahogany, with wooden bars running across it at the distance of about an inch and a half from each other; across these are laid a number of wires, about 15 or 20 to the inch. A strong raised wire laid along each of the cross bars interlaces the other wires, and this gives to laid paper its ribbed appearance. The frame of the wove moulds is covered with wire cloth, wove for the purpose, and containing from 48 to 64 wires in an inch, according to the fineness of the paper. The water mark is produced by wires bent to the shape of the device required, and sewed to the surface of the mould.

In making paper by hand two men are required to each vat; one is called the vat man, the other the coucher. The stuff being properly prepared the vatman takes one of the moulds by the middle of the short sides, and plunges it obliquely four or five inches into the vat; taking up a quantity of the stuff upon it, he raises it to a level, shaking it so as to distribute the stuff and form a uniform fabric; while doing so he gradually raises the mould, the water escapes through the wires, and the superfluous stuff escapes over the sides of the frame.

As soon as a portion of the water has drained off, the vat-man slides the mould towards the coucher, who places it for a few seconds in an inclined position, in order that more of the water may drain off. Meanwhile, he places a piece of felt, or blanket, upon a wooden plank, and then taking the mould presses the face of it upon the felt, which receives and takes off the sheet, although in a very wet state. This process is continued as long as necessary to make the quantity of any kind of paper required.

When all the water has drained away or been forced out of the sheets, they are pressed and turned several times, and then hung up to be thoroughly dried. Up to this point the paper is unfit for writing on, and it therefore has to be sized. Paper-maker's size is a gelatine procured by boiling cuttings of skins, parchments, &c., and alum, smalts, or other pigments calculated to improve the tint, or add a particular hue to the paper. The paper is dipped into this size, and after being pressed and separated, is gradually dried. After hot pressing and glazing, to finish the surface, it is carefully examined, sorted, counted into quires and reams, and then tied up in wrappers, marked with the weight and quality of the paper.

But for printing paper, this difficult and comparatively slow process of moulding separate sheets by hand, has been almost entirely superseded by the invention of a beautiful machine, which has now been in use about forty years; and the following is the description of one of its most common forms.

At one end of the room in which the machine is contained is a large reservoir of stuff, prepared as for hand-made paper. The stuff flows into a spout through a tap, which is opened more or less widely according to the thickness of the paper to be made. In this spout the stuff is diluted with a quantity of water, and it then flows into a vat, first passing through a sieve or strainer that it may be freed from any knots or hard substances that may yet remain in it. In the vat the fibres are prevented from subsiding by a little *hog*, and flows from it through a number of holes into a box, from which it passes over a piece of leather to a cloth of fine wire, on which the web of paper is first formed. This cloth is about 25 feet long and 5 wide, and contains about 3,600 holes to the square inch; it is formed into an endless band, and moves upon a number of small copper rollers attached to a frame. A rapid vibratory motion is imparted to the frame, by which the water is shaken through the wire cloth, and the fibres of the pulp become felted together.

The edges of the paper are formed by deckle straps, formed of alternate layers of linen and indian rubber, which fit so close to the band as to prevent the pulp flowing off at the sides before the paper is set.

The wire cloth, with the paper upon it, then passes between two rollers covered with felt and flannel, which, by a slight pressure imparts a certain amount of firmness to the paper. After this the paper is removed from the wire by an endless felt, which conveys the still very wet web of paper to two iron cylinders, where it

receives a very severe pressure, removing nearly all the remaining moisture; and now being tolerably firm, it is taken up by a second pair of cylinders, which removes from its surface the mark of the felt impressed by the first pair. From these a small roller guides it to a large polished cylinder, heated from within by means of steam; from this it passes to another still hotter, and again to a third, which is the hottest of the three. All moisture and roughness of surface have now disappeared; the paper is wound upon a reel, and when a certain quantity is collected it is severed from the machine, and a new reel is placed to collect a further supply. The whole operation, from the moment when the liquid pulp is flowing from the vat, to the completion of the white paper on the reel, scarcely occupies two minutes.

Most paper-makers have introduced some slight variations on this machine, but in all the principle is the same.

When the reel of paper is completed, it is cut into the requisite size of sheets by another beautiful little machine, one of which, invented by Mons Fourdrinier, may be briefly notified. Several reels of paper having been collected, the spindles are placed in grooves in a curved frame, whence the paper is passed round a drum, and then through small rollers. A thin shaving is first cut from the side edges of the paper by means of circular knives; and when it has travelled the length necessary to form a sheet, its progress is delayed for an instant, and a knife descends and cuts it across. The web then resumes its journey until it has travelled the length of another sheet, when the knife again descends, and so on till the roll is finished. The sheets thus severed are arranged into heaps by children, or are carried away by a small felt moving in connexion with the rest of the machinery.

English paper is put up in four ways: 1.—In "mill" reams of 20 quires of 24 sheets each. 2.—In "perfect" reams of 21 quires and a half. 3.—In "news" reams of 500 sheets, or 20 quires of 25 sheets each. 4.—In post paper reams, the two "outside" quires of which contain only 20 sheets each. In ordering paper to be made, it is necessary to state the number of sheets required, as well as the dimensions and weight, per ream.

Foreign paper is generally put up 500 sheets to a ream, post as well as printing papers.

SIZES OF DRAWING AND WRITING PAPERS.

	In.		In.
Emperor	72	×	48
Antiquarian	53	×	31
Double Elephant	40	×	26¾
Atlas	34	×	26
Colombier	34½	×	23½
Imperial	30	×	22
Elephant	28	×	23
Super-Royal	27	×	19
Royal	24	×	19
Medium	22	×	17½
Demy	20	×	15½
Large post	20¾	×	16¾
Post	18	×	15¼
Foolscap	17	×	13½
Pott	15	×	12½
Copy	20	×	16

SIZES OF LETTER AND NOTE PAPERS.

(4to.) Quarto or Letter size.

Small Quarto	8⅞	×	7¼
Large Quarto	9⅞	×	8
Extra Large Quarto	10½	×	8½

(8vo.) Octavo or Note size.

Small Octavo	7¼	×	4⅜
Large Octavo	7⅞	×	4⅞
Extra Large Octavo	8½	×	5¼
Albert size note	6¼	×	3⅞
Queen size note	5¼	×	3½

SIZES OF PRINTING PAPERS.

	In.		In.
Post	19½	×	15½
Demy	22½	×	17½
Medium	24	×	19
Royal	25	×	20
Double Foolscap	27	×	17
Sheet-and-Half Post	23½	×	19½
Super-Royal	27½	×	20½
Double Crown	30	×	20
Imperial	30	×	22
Double Post	31½	×	19½
Double Demy	35	×	22½

SIZES OF BROWN PAPERS.

Casing	46	×	36
Double Imperial	44	×	29
Double Four-pound	31	×	21
Imperial Cap	29	×	22
Haven Cap	26	×	21
Bag Cap	24	×	19½
Kent C	21	×	18

A Table showing the Equivalent Weights of Papers.

Demy.	Fools-cap.	Post.	Large Post.	Double Fools-cap.	Royal.	Super Royal.	Double Crown.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
12	..	8½	10¼	13½	15	16¾	18
14	6¾	10	12	16	17½	19½	21
16	7¾	11½	13¾	18¼	20	22½	24
18	8¾	13	15½	20½	22½	25¼	27
20	9¾	14½	17¼	23	25	28	30
24	11	17¼	20½	27½	30	33¾	36
	13½						

When it is required to order paper of a special or particular size, if the weight of the ream is unknown, it is quite sufficient to state the required dimensions, and to direct it to be made of an equivalent weight to any specified weight in Demy.

Paper Board.—A board on which paper is placed when wetted for printing.

Paragon.—The name of a type, one size larger than Great Primer, and smaller than Double Pica. There are 44½ lines to a foot.

Paragraph.—A small subdivision of a connected discourse; a portion of written or printed matter indicated by a break or indentation at the beginning and end. "When one subject is continued to a "considerable length, the larger dimensions of it should be put into "paragraphs. It will have a good effect, when it can be properly "done, to form the breaks at sentiments of the most weight, or that "call for peculiar attention. The facts, premises, and conclusions of "a subject, sometimes naturally point out the separations into para-"graphs."

Paragraph.—A mark (¶) denoting the beginning of a new subject, or a sentence not connected with the foregoing. Chiefly used in the Old and New Testaments. Also used as a mark of reference.

Parallel.—Marked thus (||) is used as a mark of reference to notes in the margin or at the foot of the page.

Parchment.—Prepared sheep skins, sometimes used for printing on, but generally, by printers, for covering tympans, both inner and outer. These skins should be sound, and of a uniform thickness throughout, or the impression will not be even.

Paste-bowl.—A small wooden bowl to hold paste for the use of the pressmen.

Pearl.—The na[illegible] a type, one size larger than Diamond, and one smaller than Ruby. [illegible]here are 178 lines to the foot.

Peel.—An instrument used to hang up worked off paper for drying. It is a thin, broad, wooden blade, fixed at the end of a staff, to enable the warehouseman to reach the drying lines or poles.

Penultimate.—The last syllable but one of a word.

Perfecting.—Printing the second side of a sheet of paper; also called working the reiteration.

Perfect Paper, or *Perfect Ream.*—Paper without outside quires and with the necessary number of sheets to print 500 copies with waste. A perfect ream has 21½ quires, or 516 sheets.

Perforating Machine.—A small machine used for cutting across cheque books, receipts, or any thing to which a counterpart is attached, to facilitate tearing the leaves away when written on. This machine is used to divide postage stamps.

Perforating Roll.—A wheel, on the outer circumference of which a series of small punches are affixed. It is used for dividing cheques, &c., and is more portable than, though not so rapid in its operation as the Perforating Machine.

Phrases.—The following Latin and French words and phrases are those in most common use.

Ab initio.—From the beginning.

Ad captandum.—To attract.

Addendum, addenda,—something to be added.

Ad eundem.—To the same.

A fortiori.—With stronger reason.

Ad infinitum.—To infinity.

Ad interim.—In the mean time.

Ad libitum.—At pleasure.

Ad valorem.—According to value.

Affaire de cœur.—Affair of the heart; a love affair.

A fin.—To the end.

Aide-de-camp.—Assistant to a General.

A la bonne heure.—At an early hour.—In the nick of time.

A la mode.—In the fashion.

Alias,—otherwise, as Jones *alias* Robinson.

Alibi.—Elsewhere. The plea of a person who states he was "elsewhere" at the time, than as stated in the charge.

Anglicè.—In English.

A posteriori.—From what follows, or from the effect, applied to an argument used to infer a cause, or antecedent.

Bathos.—A greek word, signifying depth, and applied to a ludicrous descent from the sublime to the ridiculous, or anticlimax.

Bona fide.—In good faith.

Bon mot.—A witty saying.

Brutem fulmen.—A harmless thunderbolt; that which threatens loudly, but without danger

Cacœthes loquendi.—Passion for speaking.

Cacœthes scribendi.—Passion for writing.

Cæteris paribus.—Other circumstances being equal.

Caput mortuum.—(The dead head) The worthless remains; the residuum, when what can be extracted is gone.

Carte blanche.—Unconditional terms.

Chef-d'œuvre.—Master-piece.

Ci-devant.—Formerly.

Comme il faut.—As it should be.

Compos mentis.—Of a sound mind

Coup de grace.—(Blow of favour) the finishing stroke.

Coup de main.—Sudden enterprise

Coup d'œil.—The view presented to the eyes from any one point, or at one glance.

Credat Judæus.—A Jew *may* believe it (I will not, understood).

Cui bono ?—Of what good.

Cum multis aliis.—With many others.

Cum privilegio.—With privilege.

De die in diem.—From day to day.

De facto.—In point of fact.

Dei gratia.—By the grace of God.

Deo volente.—God willing.

Dernier resort.—A last resource.

Desideratum.—A thing desired.

Douceur.—A present, or bribe.

En masse.—In a body.

En passant.—By the way; in passing.

Entrée.—Entry.
Ergo.—Therefore.
Errata.—Errors.
Erratum.—An error.
Et cætera.—And so forth.
Exempli gratia.—As for example.
Ex cathedra.—As a bishop or teacher would speak, officially.
Excerpta.—Extracts.
Ex nihilo nihil fit.—Nothing can come of nothing.
Ex officio.—By virtue of one's office.
Ex parte.—Partially; or on one side only.
Ex post facto.—From something done afterwards.
Experimentum crucis.—A decisive experiment.
Extempore.—At the moment; usually applied to a speech or sermon made without notes, or having been previously composed.

Fac simile.—That which is exactly like.
Færæ naturæ.—Animals still wild, unappropriated.
Faux pas.—A fault, or misconduct.
Felo de se.—He who commits felony by killing himself.
Festina lente.—Hasten slowly.
Fiat.—A decree. (Let it be done).
Finis.—The end.
Finis coronat opus.—The end crowns the work.
Formula.—A prescribed rule.

Genus irritabile.—The irritable tribe (poets).
Gratis.—For nothing.
Hora fugit.—The hour flies.
Humanum est errare.—Humanity will err.

Imperium in Imperio.—A government existing in another government.
Imprimis.—In the first place.
Impromptu.—Something written or spoken at the moment. In readiness.
In esse.—In being.
In posse.—That that may be.
In statu quo.—As it was before.
In terrorem.—In terror; as a warning.
In toto.—Altogether.
In transitu.—On the passage.
Inter nos.—Between ourselves.
In vino veritas.—There is truth in wine.
Ipse dixit.—He himself said it. A mere assertion.
Ipso facto.—By the fact, or deed itself.
Ipso jure.—By the law.

Je ne scai quois—I know not what
Jeu de mots.—Play upon words.
Jeu d'esprit.—A witticism.

Labor omnia vincit—Labour overcomes every thing.
Lex talionis.—The law of retaliation.
Locum tenens.—A substitute; a deputy.

Magna est veritas.—Truth is most powerful.
Mal àpropos.—Unseasonably.
Mauvais honte.—Unbecoming bashfulness.

Memento.—" Be mindful," a memorial.

Memento mori.—Be mindful of death.

Memorabilia.—Things to be remembered.

Minutiæ.—The smallest particulars.

Mirabile dictu.—Wonderful to tell.

Modus operandi.—The mode of proceeding.

Multum in parvo.—Much in little.

Mutatis mutandis.—After making changes.

Ne plus ultra.—That beyond which one cannot go.

Necessitas non habet legem.—Necessity has no law.

Nemine contradicente.—No one disagreeing.

Nemo me impune lacessit.—No one touches (or molests) me with impunity.

Nolens volens.—Willing or unwilling.

Nom de guerre.—Assumed name.

Non compos mentis.—Out of one's senses.

Non est inventus.—He is not found.

Non sequitur.—" It follows not"; an inconsequential proposition.

Nota bene.—Mark well.

Onus probandi.—The burthen of proving by evidence.

O tempora, O mores!—Oh the times! Oh the manners!

Otium cum dignitate.—Ease with dignity.

Outré.—Preposterous.

Pari passu.—With an equal pace.

Pendente lite.—While the action is pending.

Per se.—By itself.

Posse comitatus.—The power of the county.

Prima facie—on the first view; at first sight.

Primum mobile.—A first mover.

Pro et con.—For and against.

Probatum est.—It is tried, or proved.

Pro bono publico.—For the good of the public.

Pro forma.—For form's sake.

Pro rata.—In proportion.

Pro tanto.—For so much.

Pro tempore.—For the time being

Quære.—Search, inquire, is it so?

Quantum meruit.—As much as he deserves.

Quantum sufficit.—As much as is sufficient.

Quid pro quo.—A mutual consideration.

Quid nunc?—What now?

Quis separabit?—Who shall separate us?

Quo animo.—The intention with which.

Quod vide.—Which see.

Quondam.—Having been formerly

Reductio ad absurdam.—Reducing the thing to absurdity.

Requiescat in pace.—May he (or she) rest in peace.

Residuum.—That which remains when the rest is drawn off.

Res publica.—The common weal.

Rus in urbe.—The country in town

Sang froid.—Cold blood; coolness.

Sans.—Without.

Semper eadem.—Always the same

Seriatem.—In regular order.

Sine die.—Without naming a day.

Sine qua non.—That without which the matter is of no account; an indispensable obligation.

Status quo.—The state in which it was.

Sui generis.—Singular; of its own kind.

Summum bonum.—The greatest good.

Tapis.—Carpet.

Terra firma,—solid land.

Tête-à-tête.—Face to face, a private conversation.

Totidem verbus.—In so many words.

Toties quoties.—As often as a thing shall happen.

Toto cœlo.—By the whole heavens

Tria juncta in uno.—Three joined in one.

Ultimatum.—The last offer, condition, or concession.

Ultimo.—In the last (month understood).

Unique.—Singular.

Utile dulce—Utility with pleasure

Vade mecum.—"Go with me,"—applied as a name for a useful book; a constant companion.

Vale.—Farewell.

Veluti in speculum.—As in a looking glass.

Verbatim.—Word for word.

Versus.—Against.

Vide.—See.

Vide ut supra.—See as above.

Vi et armis.—By force and arms.

Via.—By way of.

Vice versâ.—The reverse; contrariwise.

Vis inertiæ.—The power of inertness applied to the resistance of a stationary body to motion.

Viva voce.—By or with the living voice.

Vive la bagatelle.—Success to trifles.

Vox et præterea nihil.—A voice, and nothing more.

Vox populi.—The voice of the people.

Vulgo.—Commonly.

Pica.—A type, one size larger than Small Pica, and smaller than English. There are 71½ lines to a foot.

Pick Brush.—A fine, hard brush, used to clean dirt or picks from a form when on the press.

Picker.—A fine pointed bodkin, generally made by putting a handle to a large needle, used to pick dirt from between the strokes of letters.

Picks.—When the minute blank spaces between the strokes of letters are stopped up with ink or dirt, causing a black mark to

appear in printing, they are called picks, because generally it is necessary to loosen the dirt with a picker or needle, before it can be brushed off.

Pie.—Letter mixed indiscriminately.

Pigeon holes.—Wide whites between words; more than the proper or necessary space. This cannot be avoided at times in newspaper work, where compositors often have to "make even," but it should never be allowed to pass in book work, except in cases where the page is small and the type large, or in columns of table work.

Plane down.—To make the face of all types in a form even, by passing the face of the planer over them, and striking the back of it with a mallet. The form should be planed by striking gentle blows before it is locked up, but with sharp blows afterwards, at the same time taking care that there is nothing under the type. If any substance is found to be under a page, that quarter should not be planed down; but when locked up the form should be lifted, the substance removed, and the form placed on the stone to be unlocked and relocked up properly.

Planer.—A piece of wood made smooth and even on the face, to plane, or level the types in a form by striking it on the back with a mallet. In this country usually made of Trincomallee wood, in England of beech; is about nine inches long, four broad, and two thick.

Platen.—That part of a press which comes down upon the form, and produces the impression. It is made of cast iron in one piece, with the under side planed smooth.

Plate Paper.—A thick, soft paper, smooth on one side only, intended to print steel or copper engravings. It is sometimes used for books illustrated with woodcuts, the illustrations being printed on the smooth side only. This paper requires very little wetting, and is best damped by being placed for a short time between the wet sheets of another heap of paper.

Point.—A thin piece of iron, with a spur at one end, fixed to the tympan by a screw, and used to make register. For this purpose one is placed on each side of the tympan in such a position as to cause the spurs to fall in the groove of the short cross, whatever may be the size of the form.

Point holes.—The holes made by the points in taking an impression on a sheet of paper. When the form is perfected, these holes are

fitted on the spurs, to make the pages fall exactly on the backs of those on the other side.

Pointing.—Placing the sheets on points, to make exact register. All work printed on both sides is pointed at press, but only fine work at machine.

Point screws.—The screws by which points are affixed to the tympan.

Polychromatic Press.—A press invented by Mr. S. Brown, of Syracuse, New York. It is capable of working off 500 impressions per hour, in four colours, and 1,000 per hour of Book Work or Job Printing. Its superiority consists in all the colours being worked at one impression. It can be so arranged as to print shaded letters; or a border can be worked all round a job in one colour, at the same time that the body of the form is of different colours. This is an immense advantage over the usual plan of printing each colour in a separate impression.

Pre-ante penultimate.—The last syllable but three of a word.

Press.—A machine by means of which a printed impression of types or engravings is obtained. *See* Machine, Lithographic Press, Copper-plate Press, &c.

Press-bar.—A long iron or wooden bar, used to screw down a book-press.

Pressman.—A man who executes printing at a press.

Press-pin.—A small iron bar, used in the warehouse, to screw down the book-press until some pressure is felt; when it is exchanged for a powerful lever called a press-bar.

Press Proof.—A good impression of a sheet of a work, or of a job, to read it carefully by, and to mark the errors previous to its being put to press.

Press Revise.—A sheet pulled after a form is laid on the press, to see that all corrections marked in the press proof have been attended to, and that it is perfected correctly.

Press wrenches.—Tools of different shapes, used for taking down or putting together the various parts of a press.

Printing—Is the art of taking impressions from characters or figures, on paper, linen, silk, or other fabrics.

There are several kinds of printing; from moveable letters or types, and from metal casts or stereotype plates obtained from them, for books; from engravings on wood or metal, for pictures; from letters and drawings sketched upon prepared stone, called lithography; from

prepared zinc plates, called anastatic printing, &c. Descriptions of these and other varieties of printing, and the details of the practice, are diffused through the whole of this book and may be referred to under their respective names.

The art of Printing is the most important invention that was ever introduced to the world, in its effects on the human mind, and, of consequence, on all civilised society. It preserves and disseminates all discoveries and improvements in the arts and sciences; it commemorates all other inventions; it hands down to posterity every important event; it immortalizes the actions of the great and good; and it extends and diffuses the word of God to all mankind;—and yet this very art has left its own origin, at least in Europe, enveloped in mystery and obscurity.

Printing, it is believed, was first invented in China, that country which, the parent of many arts, never seems to advance beyond the first idea. Foong-taou, who was a minister of state in the tenth century, wished to multiply the number of copies of a book which pleased him, and found writing so tedious that he endeavoured to find some plan by which both time and trouble could be saved. His natural idea was to endeavour to multiply writing in some way similar to that in which he could multiply the impressions of a seal,—the only difficulty in the way was how to make a seal or stamp like the writing to be multiplied. At last, after many trials, he placed a page of writing, while it was wet, upon the face of a smooth piece of wood. A copy was of course transferred to the wood; then all the wood not touched by the writing was cut away, and the block of wood was converted into an engraved tablet. The letters thus formed by Foong-taou were wetted with some kind of ink, paper was pressed upon them, and a copy was thereby transferred to the paper. To this day the Chinese print as they did nine hundred years ago. While in other countries such vast and wonderful improvements have been made in the noble art, in China no change from the first invention has taken place.

It may be well to introduce here a short account of the Chinese mode of printing. A block of wood, generally of apple or pear, is cut to the size of the intended page. After being smoothed it is rubbed over with boiled rice, which gives it a white polished surface. The characters are written on a thin tissue paper, and while yet damp, are turned with the face on to the prepared wood and gently rubbed over the back;—this leaves an impression on the wood. The white parts are now cut away, and the block is ready for printing from. No press is used in Chinese printing. The paper is so thin and so easily torn that the force of a press would cause it to tear to pieces, and a

little friction will give the required impression. The workman holds in his hand an handle with a brush at each end; with one he lays ink on the block, and covering it with a piece of paper, rubs it gently with the other. This is quite sufficient, with the soft paper used, to obtain a clear copy; and the pressmen, if they may be so called, are generally so expert as to be able to print 2,000 copies per day. When printed, two pages are placed back to back together to make one leaf, and so are bound into books.

For three hundred years the Chinese practised the art unknown to the western nations which boasted of greater progress in arts and civilization. China itself was unknown to the rest of the world, except by name; but the veil which had so long concealed one of the most wonderful nations of the world, was removed in the thirteenth century by the Venetian traveller, Marco Polo. After being absent from Europe for many years; on his return, one of the wonders he had to speak of, was this invention of printing.

About the time that Marco Polo was relating the wonders of his travels, the most simple form of printing began to be practised in Europe. In the year 1255 the two Cunios, who resided on the gulf of Venice (the native place of Marco Polo), began to print with wood engravings. From this time, for about 75 years, nothing was heard of printing in Europe; but in 1350 playing cards were printed from blocks, in precisely the same manner as the Chinese print, with a brush, and these two facts favour the presumption that the art was translated from China to Europe through Marco Polo's description of it. After this, little books were printed from blocks in the same manner as cards, and some of them are still in existence. One of these, printed in the year 1423, if the date affixed may be trusted, is now in the Spenserian Collection (*see* wood engraving), and another, known as the *Biblia Pauperam*, or Poor Man's Bible, printed between the years 1420 and 1430, seems to have been thought a wonder in its day. This contained from 40 to 50 leaves; and, judging from the mutilated state of the copies that remain, seems to have been in great request.

The next and great advance in the art of printing, was the introduction of moveable types. This was a natural improvement upon block printing, yet it was in a manner the result of accident. Evidence as to the discoverer is rather conflicting, but the general belief seems to be that it was one Laurence Zanssen, or Costa, who lived at Haarlem in 1424. One day in his efforts to amuse his grand-children, he cut some letters out of a smooth piece of beech, and

daubing them with some kind of colour, stamped them on pieces of paper as he would a seal. The first letters were reversed, thus, ꟻ, in their impression, he therefore cut them in reverse, and when he stamped them again, found the impression was the right way. The thought struck him then, that what he had produced in sport might be turned to use, and he consulted with his son-in-law, Joseph Peter. The result of their deliberations and experiments was the formation of moveable wooden types. They found that common ink made blots, and therefore made it thicker. At length they determined to print a book, and with infinite trouble they succeeded. Their first attempt contained the letters of the Alphabet, the Lord's Prayer, the Apostle's Creed, and three short prayers. A copy of this book is still in existence; it is most rude in its appearance, the letters being uneven in size, and out of line, without points, and words divided whenever they end the line. It is supposed to have been finished about the year 1439. A comparison with books printed soon after shows this to have been a first attempt.

Coster seems to have carried on the business of a printer for many years, and to have amassed a considerable fortune; but little is known of the progress of the art till about the year 1450, when John Gutenburg began to print from metal types.

But this story of the discovery of Printing by Laurence Coster has been set down by many as apocryphal, particularly by the inhabitants of Mentz, who claim the honor of the discovery for their townsman, John Gutenburg, or Gensfleisch. This man, in 1424, was settled in Strasbourg, where he carried on the business of a lapidary and mirror polisher, and is supposed to have conceived the idea of printing about the year 1440, just after it is stated to have been discovered by Laurence Coster. In 1436 Gutenburg took into partnership John Riff, Andrew Drizehn, and Anthony Hielman, all natives of that city. Their agreement was for the term of five years; but owing to some differences between them, they separated in 1439, before its expiration. In 1450, Gutenburg was associated with John Fust, or Faust; and it was about this time, as shown by all known authorities, that metal types were first made. The Abbot Trithemius, in his "Chronicon Spanheimense," says, "about this time (1450) the art of printing and working single types was found out anew, *instead of by the previous* wooden types, in the City of Mentz, by one John Gutenburg, who having spent his whole estate in this difficult discovery, by the assistance and advice of others, brought his undertaking at length to perfection."

With Gutenburg and Faust was associator Peter Schœffer, who had been the servant of the latter. He was the inventor of punches of steel, by which matrices were struck, from which the metal types (which were originally cut singly) were cast. This produced uniformity in the length and form of letters. The first work which issued from the press of these three men, is generally supposed to be a Latin Bible, without date, but which most probably was finished about the year 1455. After this Gutenburg and Faust's partnership terminated, and in 1457 Faust and Schœffer published the Psalter. Another Psalter was printed by them in 1459, and in the same year Durandi Rationale, a treatise on the liturgical offices of the Church. In 1460 Gutenburg printed the great Latin Dictionary called "Catholicæ Johannis de Balbis," and the "Constitutions of Clement V." In 1460-62 another Bible, without a date, was issued by one Pfister, who had set up a press at Bamberg. In 1465 Faust produced the "Offices of Cicero," and in the following year a second edition of the same work; shortly after this he went to Paris, where he is supposed to have died of the plague.

In 1462 the Archbishop Adolphus sacked the City of Mentz; the printing trade of the place was ruined, and the workmen spread themselves amongst various cities, and set up on their own account. Bamberg, Cologne, Strasbourg, Augsburg, and other cities, had their presses; yet between 1461 and 1470 only 24 different works appeared. In 1465 a printing office was established at Subiaco in the Roman state. In 1470, two of Faust's workmen commenced printing in Paris, and Ulric Gering and his partners set up a press in the same year. Cumini, a Goldsmith, established one at Florence, and John Spire one at Venice.

The first book printed in Spain, appeared at Valencia, in 1474. In 1475 printing was commenced at Barcelona; at Saragossa and Seville in 1477; and at Salamanca in 1485.

In 1488, Aldus, a learned printer at Venice, invented Italic letters, and the Aldine printing in after years became famous for its beauty. Aldus printed the works of nearly all the Greek authors in their own language, in rapid succession, and with great beauty. Learned men became printers, others took a pride in correcting for the press; and the printers published the names of their eminent assistants on the title pages, as the names of editors and authors are now used, to invest the work with a higher guarantee of character and ability.

Printing now began to spreadall over the continent with great rapidity. Presses were established in the Low Countries, at Daventer, Utrecht, Louvain, Basle, and at Buda, in Hungary; in 1490 the art reached Turkey, and in 1560 penetrated into what was then semi-barbarous Russia.

In France many women have distinguished themselves in the art, amongst others, Charlotte Guillard (1490-1540), the widow of Berthold Rambolt, who kept several presses at work, and printed a great number of large and very correct editions both in Latin and Greek. Amongst her best works are the Bible, the Fathers, and the works of St. Gregory, in two volumes, which are so accurate as to contain *only three faults!*

Let us now turn to the introduction of the art into England.

William Caxton, the father of the English Press, was apprenticed to a London merchant in 1412, went to the low countries in 1442, and resided by turns in Brabant, Flanders, Holland, and Zealand, for near thirty years, during which time he made himself master of the art of printing. While at Cologne he translated his "Recueil de l'Histoire de Troye," and published it; soon after this he removed his apparatus to England, and settled at Westminster under the patronage of the Abbot. In 1474 he produced the first specimen of English typography, "the Book of Chess." In 1477 he published "Dictes and sayinges." Caxton's first types were of a kind called *Secretary*, but not what is known as secretary now. In 1482 he added another sort, which was a great improvement on the first; and in 1490 a sort which was still better. He died about 1491; but in the ten years in which he carried on the business of a printer, he published 64 different works, though in a literary point of view they indicate but a low state of knowledge in England.

During Caxton's time one John Lettase also set up a Press in London, in which he printed two works alone; he was afterwards in partnership with William Machlinia. They were the first printers of law, and only produced about eleven works.

Caxton was succeeded in his business by Wynkyn de Worde and Richard Pynsent. The first, who had accompanied Caxton from Cologne, was a very accomplished man, and even excelled his master in the art. He introduced the Roman letter, and the shape of his types was retained for two centuries. These two printers flourished between the years 1491 and 1534, and between them issued 618 works. Julian Notary also had a press from 1499 to 1515, but did not issue many works.

In 1480 a press was set up in the Benedictine monastery at St. Albans. Printing was introduced at Oxford between 1480 and 1485, by Theodore Roode and John Hunt; the former a native of Cologne, the latter an Englishman.

In 1507 Walter Chapman opened a printing office in Edinburgh.

In 1509 printing was introduced into the City of York by Hew Goes.

John Sibert introduced the art to Cambridge, and printed there in Latin, Greek, and English. His books bear date 1521 to 1522.

Since that time printing presses have been established in almost every town of any importance throughout Europe, America, Australia, and indeed everywhere where white men have settled.

The missionaries were the first to introduce printing in this country, and the people have not been slow in availing themselves of the art. Letter or Lithographic Presses have been established in all parts, and doubtless will ultimately do much towards educating the people.

Proof.—An impression of a galley of matter, sheet of a job, or work, to be examined to see if it is correct.

Proof Paper.—A cheap, thin paper, used to pull proofs, or to strike off common work.

Proof Press.—A Press kept to pull proofs at.

Pull.—To take an impression of a form at the Press.

Punctuation—Is the art of dividing a written composition into sentences, and parts of sentences, by points or stops, for the purpose of combining those words together that are united in construction, and separating those which are distinct.

The following explanation of some of the terms which occur in the Rules is intended to assist the learner in determining the proper application of the points.

A SENTENCE is an assemblage of words forming complete sense.

A SIMPLE SENTENCE contains but one member, which consists of one subject, and one finite verb; as, "temperance preserves health."

A COMPOUND SENTENCE contains more than one member, and more than one subject, or one finite verb, either expressed or understood; or, it consists of two or more simple sentences connected together; as "good nature mends and beautifies all objects." "Virtue refines the affections; but vice debases them."

A CLAUSE, or MEMBER, is one of the simple sentences of which a compound member is formed; as, "he was told to clear the stone; but he went to his frame." Here there are two clauses.

A COMPOUND MEMBER is made up of two or more clauses or simple members; as, "the ox knoweth his owner, and the ass his master's crib; but Israel doth not know, my people do not consider."

Here will be found four clauses, or simple members: the first two forming one compound member; and the latter two another compound member.

A PHRASE means sometimes part of a sentence, and sometimes a whole one.

The Comma [,] is used to denote the shortest pause in punctuation, and the smallest division in composition.

RULE I.—OF THE NOMINATIVE.—A simple sentence admits of no marked pause, except a full stop at the end of it; as,

"The Secretary stood alone. Modern degeneracy had not reached him."

No comma ought to be inserted after the subject (1) or nominative, unless it be accompanied by adjuncts which are put in a parenthetical (2) form; as,

(1) "Inattention to business in hand is a sign of a frivolous mind."
(2) "Inattention to business in hand, let it be what it will, is a sign of a frivolous mind."

RULE II.—WORDS IN THE SAME CONSTRUCTION.—Words of the same part of speech, occurring in the same construction, are separated from each other by commas; as,

"The turbulence, the insincerity, the convulsions to which the extension of knowledge amongst the lower orders has given rise, will in time be forgotten."

"Success depends upon acting prudently, steadily, and vigorously, in what we undertake."

To this rule there are two *exceptions*. 1st. When two adjectives are joined together without a conjunction, and the first of which qualifies not only the noun but the other adjective, no commas are used; as,

"Locke was a famous modern philosopher."

2nd.—When *only two* words of the same part of speech are closely connected by the conjunction *and*, the comma is omitted; and the same remark is applicable to *or;* as,

"Truth is uniform and consistent."
"Is it right or wrong?"

If, however, the parts connected are *not* short, a comma may be inserted; as,

"The traditions and local attachments of the clans were lost by the dispersion of their members, and general adoption of new names and distinctions."

"Is acting in this way right, or is it wrong?"

RULE III.—OF A DIRECT ADDRESS.—Expressions in a direct address are separated from the context by commas; as,

"Therefore, good Brutus, be prepared to hear."

"Boast not, my friends of to-morrow."

RULE IV.—MEMBERS OF SENTENCES DEPENDING ON EACH OTHER.—When a member of a sentence is followed by another immediately depending on it, a comma is inserted between them; as,

"Those who only look at a building as a fine feature in a landscape, rarely think of the art with which such a fabric is raised."

"Much of the durability of a building depends on the propriety of the design, but much also depends upon the nature of the materials."

"It is the fault of some writers, that they pursue their thoughts to their last ramifications."

RULE V.—WORDS EXPLANATORY, INCIDENTAL, AND CONDITIONAL.—Explanatory, incidental, and conditional words or phrases, whether introduced at the beginning or the end, or in the middle of sentences—must be separated from the context by commas; as,

"The Government, approving the plan, put it in execution."

"We started early, and, before the close of the day, arrived at Poodoovail."

"The people, whose constitutional rights had been materially impaired, were ever ready to defend themselves."

"Every sensible person knows full well that war is a calamity, and views it with aversion; but at the same time, in the present state of the world, we are bound to admit that frequently it cannot be avoided."

"Formerly, his work was, in many respects, imperfect; it was, therefore, not much approved."

"Truth, when it is reduced to practice, easily becomes subject to caprice and imagination."

Many of the foregoing examples may, with propriety, be applied to Rule IV.

The following words and phrases may be separated from the context by commas:

Nay, so, hence, then, therefore, again, first, secondly, formerly, now, lastly, once, more, above all, on the contrary, in the next place, in short, in truth, &c.

When, however, these expressions are very closely connected with the sense, the comma is better omitted.

Rule VI.—Observations and short Quotations.—A short quotation, or any remarkable expression or observation that resembles a quotation, may be properly preceded by a comma; as,

"Such seems to be the disposition of man, whatever makes a distinction produces rivalry."

"He said to the maistry, proceed immediately with the work."

"Religion is so well adapted to the nature of man, that, without her assistance, we should live and die like the lower creation."

"Plutarch calls lying, the vice of slaves."

"It hurts a man's pride to say, I do not know."

But if the members succeeding each other are very closely connected, the comma is superfluous; as,

"He told me to do so."
"He says it is not finished."
"I doubt not that mind is immortal."
"He bade me go home."

Rule VII.—Of comparatives.—Simple members of sentences, connected by comparatives, are distinguished by a comma; as,

"As the hart panteth after the waterbrooks, so doth my soul pant after thee."

"Will bind the whole together on the surest principles of construction, as the separate staves of a vessel are united by the hoops."

"The liberal reward of labour, as it encourages the propagation, so it increases the industry of the common people."

"Charity, like the sun, brightens all objects."

If the members in comparative sentences are short, the comma may be omitted; as,

"Mankind act more often from caprice than reason."
"It is better to get wisdom than gold."

When the members of comparative sentences are compound, they may be set off by a semicolon.

Rule VIII.—Of the conclusion of a sentence referring to two preceding members.—When the concluding part of a sentence refers to two preceding members, it is separated from the last member, and the members from each other, by commas; as,

"Good men are often found not only in union with, but in opposition to, the views and conduct of one another."

"He was composed both under the threatening, and at the approach, of a cruel and lingering death."

But when the concluding part of a sentence is short, it is better to omit the comma before it; as,

"Alfred was not only the king, but the father of his people."

Rule IX.—Relative Pronouns.—Relative pronouns, expressed or understood, admit a comma before them; as,

"He preaches sublimely, who lives a sober, righteous, and pious life."

"The book of Job is a poem, full of the noblest and most majestic figures."

This may also be applied to cases in which a relative pronoun is preceded by a preposition; as,

"No thought can be just, of which good sense is not the ground work."

When two phrases are closely connected by a relative, limiting the general notion of the antecedent to a particular sense; the comma should be omitted; as,

"A man who is of a detracting spirit will misconstrue the most innocent words that can be put together."

Rule X.—Transposition of adjuncts.—When the natural order of adjuncts or circumstances is inverted, they may be set off by commas; as,

"Virtue must be formed and supported, not by unfrequent acts, but by daily and repeated exertions."

When such sentences are put in the natural order the comma may be omitted; as,

"Virtue must be formed by daily and repeated exertions, not by unfrequent acts."

Rule XI.—Words in opposition.—When words are placed in opposition to each other, or with some marked variety, they generally require to be distinguished by a comma; as,

"The wood is hard, yet easily worked."

"This stone is very soft, but durable."

Rule XII.—Where a word is understood, a comma may be properly introduced; as,

"From law arises security, from security curiosity, from curiosity knowledge."

In this example the verb *arises* is understood before curiosity and knowledge.

The Semicolon [;] is used for dividing a compound sentence into parts, not so closely connected as those which are separated by a comma only, nor so little dependent on each other as those which are distinguished by a colon.

Rule I.—When a sentence can be divided into two or more members, which members are again divided into members more simple, the former are to be separated from the latter by a semicolon, thus;

"Towns without number sprang up in the place of the ancient congregation of huts; and necessities were gradually created, which were incompatible with the old modes of life."

"In his buildings he coveted three things, beauty, usefulness, and durability; his taste secured the first, his acquaintance with the wants of man obtained the second, &c."

"It will be seen how, in two important dependencies of the crown, wrong was followed by just retribution; how imprudence and obstinacy broke the ties which bound all the North American colonies to the parent state; how Ireland remained, indeed, a member of the empire, but a withered and distorted member."

"As we perceive the shadow to have moved, but did not perceive it moving; so our advances in learning, as they consist of such minute steps, are only perceivable by the distances."

"There are men whose powers operate at leisure and in retirement, and whose intellectual vigour desert them in conversation; whom merriment confuses, and objection disconcerts; whose bashfulness restrains their exertion, and suffers them not to speak till the time of speaking is past; or whose attention to their own character makes them unwilling to utter, at hazard, what has not been considered, and cannot be recalled."

"Such is the refuge of our youth and age,
The first from hope, the last from vacancy;
And this worn feeling peoples many a page,
And, may be, that which grows beneath mine eye;
Yet there are things whose strong reality
Outshines our fairy land; in shape and hues
More beautiful than our fantastic sky,
And the strange constellations which the muse
O'er her wild universe is skilful to diffuse."

Semicolons may be inserted between the parts of many compound sentences that do not admit of being subdivided; as,

"Stones grow; vegetables grow and live; animals grow, live, and feel."

Rule II.—When the members of a compound sentence are connected by a particle denoting a modification of the former clause, or giving a new turn to its meaning, a semicolon may with propriety be inserted; as,

"Genius breaks from the fetters of criticism; but its wanderings are sanctioned by its majesty and wisdom."

"Do not think yourself perfect; for imperfection is natural to man."

The Colon [:] is used to divide a sentence into two or more parts, less connected than those which are separated by a semicolon, but not so independent as separate, distinct sentences.

Rule I.—When a sentence can be divided into two parts, either of which parts is again divisable by a semicolon, the former parts are to be separated from the latter by a colon; thus,

"If any man think it convenient to seem good, let him be so in reality; and then his goodness will appear to every one's satisfaction: for truth is convincing, and carries its own light and evidence along with it; and will not only commend us to every man's conscience, but which is much more, to God, who searcheth our hearts."

"Without this diffusion of wealth among the lower orders, the important effects resulting from the invention of printing would be extremely limited; for a certain degree of ease and independence is necessary to inspire men with the desire of knowledge, and afford them the leisure which is requisite for acquiring it: and it is by the rewards which such a state of society holds up to industry and ambition, that the selfish passions of the multitude can be interested in the intellectual improvement of their children."

The propriety of using or omitting a colon or semicolon, is sometimes determined by the introduction or the omission of a conjunction; as,

"Do not flatter yourselves with the hope of perfect happiness: there is no such thing in the world."

"Do not flatter yourselves with the hope of perfect happiness; for there is no such thing in the world."

Rule II.—A colon is used, when the preceding part of a compound sentence is complete in sense and construction; and that which follows is some remark, naturally arising from it, which adds to the sense without modifying; as,

"Study to acquire the habit of thinking: no study is more important."

Rule III.—When, in a compound sentence, two objects are compared or contrasted with one another, without the use of connecting particles, a colon may be inserted between the members; as,

"A friend exaggerates a man's virtues: an enemy magnifies his crimes."

Rule IV.—A colon may be placed before an example, a quotation, or a speech, which is formally introduced, and composed of members divided by other points; as,

"The air was sweet and plaintive; and the words, literally translated, were these: 'The winds roared and the rain fell; when the poor white man, faint and weary, came and sat under our tree.'"

When the quotation includes several sentences, it is usual to commence a new paragraph.

A Period [.], or Full Point, is used to terminate a sentence which is so complete and independent as not to be connected in construction with the following sentence; as,

"Fear God. Honour the King."

"The art of constructing a sound wall was a favourite study with him. To convert an unseemly pile of stones, a stack of unsquared timber, and some tons of rusty iron, into a magnificent palace, requires something more than mere animal exertion."

"The Secretary stood alone. Modern degeneracy had not reached him. Original and unaccommodating, the features of his character had the hardihood of antiquity."

The period, besides its use at the end of a sentence, is employed after an abbreviation, to denote that letters are wanting to complete the word.

A note of Interrogation [?] denotes that a question is asked; as,

"What day of the month is this?"
"Where is the peon?"
"Who made up signature K of Report on District Roads?"
"Has that sheet been read for press yet?"

Where it is only said that a question has been asked, a note of interrogation should not be used; as,

"The Cyprians inquired of me why I wept."
"The engineer asked him who turned the arch."
"When the inspector saw how badly the work was executed, he asked who was the contractor."

It is a very common error to make one interrogative mark represent several questions belonging to the same sentence; and to substitute semicolons or dashes for notes of interrogation. This should be carefully avoided.

In the following passage each question should be marked with its proper points: "What is civilization—where is it—what does it consist in—where does it commence—where does it end—how is it known—in short, what does it mean?"

An Admiration, or Exclamation [!], is used after words or sentences expressing a sudden emotion or ardent wish, or denoting admiration or sorrow; and after an address to a person, when particularly emphatic; as,

"Look, my Lord, it comes!"

"Fathers! Senators of Rome! the arbiters of the world! to you I fly for refuge!"

"Father of light and life! thou good supreme!
Oh teach me what is good! teach me thyself!
Save me from folly, vanity and vice,
From every low pursuit!"

"God of the fair and open sky!
How gloriously above us springs
The tinted dome of heavenly blue,
Suspended on the rainbow's rings!"

"Look, Marcus! ah, son of Lucius, look on her!"

Interjections, being expressive of some passion, are generally accompanied by marks of admiration; as,

"O virtue! how amiable thou art!"
"Alas! poor Yorick!"

The following passage will serve to illustrate the distinction between the notes of exclamation and interrogation:

"Whither shall I turn? Wretch that I am! to what place shall I betake myself? Shall I go to the Capitol? alas! it is overflowed with a brother's blood! or shall I retire to my house?—yet there I behold my mother plunged in misery, weeping and despairing!"

It is sometimes difficult to distinguish between an interrogative and exclamatory sentence; it is, therefore, necessary that the compositor or examiner should carefully peruse the ambiguous passage, comparing it with the context, in order to ascertain whether it expresses more an idea of emotion than of enquiry.

The Parenthesis, thus ( ), is used to include a member which is inserted in the body of a sentence, to illustrate or enforce its meaning, but which is not necessary to the sense, and does not affect the construction; as,

"Consider (and may the consideration sink deep into your hearts) the fatal consequences of a wicked life."

"In 1788, Mr. (afterwards Sir John) Soane was appointed architect."

"The ceiling is trabeated (cross beamed), deeply coffered, and enriched with greek frets."

"Open daily (Sundays excepted) from eleven till four."

"The pix (from the Latin pixis) is the box in which the coins to be weighed and analysed are contained."

When the incidental clause is short, or coincides with the next of the sentence, the parenthesis may be omitted, and commas inserted in their place; as,

"Every star, if we may judge by analogy, is a sun to a system of planets."

The incidental clause ought to be accompanied with every point which the sense would require if the parenthetical characters were omitted. It should terminate with the same kind of stop that should terminate the member which precedes it, which stop should be placed after the parenthesis, thus:

"Pride, in some disguise or other (often a secret to the proud man himself), is the most ordinary spring of action among men."

The Dash [—], though often used improperly,* may be inserted when the sentence breaks off abruptly, when a significant pause is required, or when there is an unexpected turn in the sentiment.

"Here lies the great—False marble! where?
Nothing but sordid dust lies here."

"Every one knows what he means by civilization—till he is asked; every one knows what it means—till he compares his opinions with his neighbour; all nations know what it means—till they compare with neighbour nations; nobody agrees, nobody knows where it is. At least, we do not—that is certain."

The dash may sometimes be used as a mark of parenthesis.

The Apostrophe ['] is frequently inserted in poetry, and sometimes in prose, to indicate the omission of a letter or a syllable. It is also used to show the possessive case of nouns, with an *s* following

* Cobbett, in his Grammar, says, the *dash* is a cover for ignorance in the use of points, and it can answer no other purpose.

when in the singular number; but where an *s* is added to the word to form the plural, the apostrophe is used after it, without an additional *s*. The *s* is likewise omitted after the apostrophe where the adding it would create too much of a hissing sound, as, for righteousness' sake, for conscience' sake.

The Hyphen [-] is used when a word is divided, the first part printed at the end of one line, and the latter part at the beginning of the next. It is also employed to connect compound words.

Marks of quotation [" "] are used when a passage is transcribed from a speaker or author in his own words. Such passages should be distinguished by having two inverted commas ["] at the beginning, and two apostrophes ["] at the end.

When a quotation is introduced within the body of the primary one, the additional quotation ought to be commenced with one inverted comma, and closed with one apostrophe. The following example will apply to both these Rules.

In St. John's Gospel we have the following words: "Nathaniel said unto Philip, 'Can there any good thing come out of Nazareth?' Philip saith unto him, 'Come and see.'"

When several successive paragraphs are taken from an author, each paragraph is commenced by inverted commas, but not closed by apostrophes till the quotation terminates.

Marks of quotation may be omitted where the matter extracted is not given in the exact words of the author; or where a quotation in a foreign language, or a passage from Holy Writ, is short, and distinguished by italics.

Quadrats.—Pieces of metal, of the depth of the body of the type for which they are cast, and lower than the type, so as to leave a blank space on the paper in whatever part of the page they are inserted. They are used to fill out short lines; to form white lines; and to justify letters or figures in any part of a page.

Quarto.—A sheet of paper folded into four leaves, or eight pages.

Quire—Of paper, 24 sheets.

Quoin drawer.—A drawer under the imposing stone, in which quoins are kept.

Quoins.—Short pieces of wood, of the same height as the furniture, and tapering in their width; used to wedge the pages up with in a chase. They are made of various sizes, to suit the difference of the thickness in the side or foot-sticks.

Quoin up.—To fit the quoins in a form in such a manner that when locked up they shall completely and properly secure the types.

Quotation.—See punctuation.

Quotations.—Pieces of hollow metal, generally cast quadrat height, and to even pica ems in length and width. A common size is three ems wide and from four to six ems long.

R.

Rag.—In type-founding, a burr on the edge of a letter.

Reader.—A person whose duty it is to read proofs in a printing office, for the purpose of correcting the errors that are unavoidable from the process of arranging the types into words, lines and pages.

The general interest of literature depends much on the grammatical accuracy and typographical correctness of the printer's labour; it will be readily seen, therefore, that good, careful, steady readers, are indispensable in every printing office.

It is desirable that persons who hold the situations of readers, should have been previously brought up as compositors, as, by their practical acquaintance with the mechanical part of the business, they will be able to detect errata which may easily be passed over by a man of science and learning who does not know the technicalities of the art, and cannot point out imperfections in workmanship. But although it is desirable that readers should have been previously brought up as compositors, it is not absolutely necessary, as long practice in reading proof-sheets for the press, a quick eye, and application to his duties, will enable a reader, though not a compositor, to detect those minor deviations from correctness which the inexperienced and the careless are apt to overlook. But while these habits are acquiring, without which no person can safely be trusted to read a sheet for press, books are liable to go forth to the world in a manner which reflects discredit on the printer and annoys the author, who may find he has thoughts and expressions given to him the very opposite of what he intended to express. No form, therefore, should be put to press, until it has been read by an experienced reader.

But habit is not sufficient to form a competent reader, unless he possesses those literary qualifications which are obviously necessary in an employment of this nature. A reader ought at least to be well

versed in all the peculiarities and idioms of the English tongue: and a knowledge of the dead languages, so often used in quotation, would be useful to him. In this country a knowledge of the vernaculars should also be a recommendation; so many phrases from them being interspersed in almost all works written here.

Many writers are apt, in the warmth of discussion or the laborious exercise of the thinking powers, to pass over such deviations from pure diction and grammatical accuracy as they have acquired in their ordinary conversation with mankind. Now, although no corrector of the press can be required to do more than *follow his copy*, that is faithfully to adhere to the original, yet he should point out such imperfections or mistakes by underlining the faulty sentence, and marking "query" (?) in the margin, thus drawing the author's attentions to the part, and removing the responsibility from himself. Some few works are "put to press" direct; in such a case the reader, of course, is responsible, and queries are of no use.

The following is the process which proof sheets ought to undergo before they are put to press.

The compositor should when a proof has been pulled, hand the copy and proof to the reader, for the purpose of comparing or reading. If the latter, which is most general, the reading boy must read the copy aloud, while the reader looks at the proof. The boy should be able to read any copy put into his hands with ease and distinctness; he should not read too fast, but pay the same attention to the subject as though he were reading for amusement or edification. The eye of the reader should not follow, but rather precede the copy; as, when accustomed to this mode, he will be able to anticipate every word in the copy; and should a word or sentence happen to have been omitted, his attention will the more sensibly be arrested by it when he hears it pronounced by his reading boy.

After the proof has been read, the signature, head lines, and folios of each page should be carefully examined, and the signature and folio of the ensuing sheet be accurately marked on the margin of the copy. A crotchet should be made between the last word of the sheet read and the first of the next sheet, in order that both compositor and reader may be certain where the sheet commences.

The form being corrected in the metal, a revise should be pulled, and with the proof just corrected be conveyed to the reader, whose duty it is to collate the corrected sheet with the one before read, to ascertain whether the corrections have been made, and that other errors have not been created in the process, as it not unfrequently

happens that compositors, in the course of correcting, either transpose a letter or word, or alter a letter in a word that is not marked, thereby not only leaving one error uncorrected, but also making another. It often happens, too, that in raising a line to change the spaces, some of the letters get transposed. It is absolutely necessary, therefore, in revising a proof, that the reader should not only look at the word marked, but also glance his eye along every line in which an alteration has been made. Should outs or doubles occur in a proof, it ought to be again read by copy to prevent any improper connexion in the over-running, either by the insertion or removal of words. In the final revision of a proof sheet, the eye should be cast along the sides and heads of the respective pages, lest a letter should have fallen out, the form have been locked up crookedly, or the edges battered or bitten by the frisket.

Stower, an early writer on the Art of Printing, says, "A reader therefore should be a man of one business; always upon the alert, all eye, all attention. Possessing a becoming reliance on his own powers, he should never be too confident of success. Imperfections cling to him on every side, errors and mistakes assail him from every quarter. His business is of a nature that may render him obnoxious to blame, but can hardly be said to bring him in any large stock of praise. If errors escape him he is justly to be censured, for *perfection is his duty.* If his labours are wholly free from mistakes, which, alas! is a very rare case—he has done no more than he ought, and consequently can merit only a comparative degree of commendation, in that he had the good fortune to be more successful in his labours after perfection than some of his brethren in the same employment."

Ream.—A quantity of paper consisting of 20 quires of 24 sheets.

Records.—Type so called, cast to resemble the abreviations used in ancient M.S.S.

References.—Marks used to show to what part of the text marginal or foot notes refer. The ordinary marks are as follows, and are used in the order in which they are arranged *, †, ‡, §, ||, ¶. When more than six notes occur in a page, two of each reference are put to a note, but this has an unsightly appearance.

Some printers use italic lower case letters, placed between parenthesis, while others employ figures for the same purpose. The most neat in appearance, however, are superior letters or figures [a]; either of which are used when the notes on a work are collected at the end of a volume.

Register.—So to arrange the furniture in a form, or both forms of a sheet, that the pages may fall exactly on the back of each other.

Register sheet.—The sheet or sheets used to examine the register of a form. Dry proof paper is generally used for this purpose.

Reglet.—Wooden furniture of various thickness, used to white out titles, jobs, or to economise quadrats. The usual sizes made are pearl, nonpareil, brevier, long primer, pica, great primer, and double pica.

Register Colour Points—Are made expressly for ornamental printing, with spurs made to screw in, so that in case of an accident an old spur may be taken out with a small pair of plyers, and a new one be inserted in its place, a plan which enables the pressman to go on with his work without making fresh register. These points are not fixed to the tympan, but are screwed on to some part of the furniture of a form. If four colours are to be worked, two brasses, each with four points or spurs, are fixed to the form, and the first colour is then worked, pricking four holes on each side of the sheet. The points for the remaining colours are single, and attached to the tympans in the ordinary manner. It is necessary to observe that two colours must not be perfected by one set of point holes.

Reiteration.—A term used by pressmen to denote that they are working the second side of a sheet.

Revise.—A proof pulled immediately a form is laid on the press, and taken to the reader by the pressman, that he may ascertain if all corrections marked in the press proof have been attended to, before giving the order to strike off. Also, any proof pulled to compare with former corrections.

Ribs.—The tramway of a press, on which the carriage traverses in running in and out.

Rice paper—so called. A material used by the Chinese for drawing or printing on. It is prepared from the stem of a leguminous plant, which is cut into pieces eight or ten inches in length. These, again, are cut into one continuous spiral film, on the same principle as veneer cutting. These laminæ being spread out and pressed flat, form thin sheets, which after being dyed and otherwise prepared, constitute the rice paper of the Chinese.

Rides.—Leads or furniture are said to ride when one end projects over another. This should be carefully guarded against, as, either letters will be in danger of falling out, or, if locked up sufficiently tight to lift, the pages will be bent.

Rinse the Form.—This should be done by the pressman as soon as a form is struck off. After being taken to the lye trough, and well brushed over, letter, furniture, and chase, with the lye, it should be stood nearly upright against a wall or other support, and be well rinsed by having water poured over to wash away the lye and the ink it has dissolved.

Rinsing Trough.—A shallow wooden trough, lined with lead, used to lay up forms in. The edge is generally bound with iron, and the bottom covered with a loose board to prevent the iron chase cutting the lead.

Rise.—A form is said to rise when every thing is properly justified, so that when locked up nothing will fall out.

Risers.—The material upon which stereotype plates are fixed to be printed. These are sometimes made of wood, with the plates screwed or fastened by overhanging brass catches; sometimes of type metal. Various other substances have been used, such as brass, gun metal, gypsum, cork, &c., but all of these have failed. Those most commonly in use at present were invented by Mr. Hansard, and are of type metal cast to even ems, like French furniture, to make up to any size of page. The plates are fixed to these risers for working by moveable clasps, or clams, of brass, which are pegged on to the sides of the metal, and catch over the bevel edge of the plate.

Roller.—A cylinder coated with composition, fixed in an iron frame, and revolving upon an iron rod running through it, with which to ink forms, preparatory to taking impressions.

Formerly balls were used for inking, but rollers have entirely susperseded them.

The composition used for making rollers was first used for balls by Mr. B. Foster, and was a great improvement on the old pelts. Shortly afterwards steam printing was introduced, and then it became necessary to use rollers to ink the forms. Skins were tried, but the edges would not join well, and in consequence all work was defaced by marks; but Konig covered his rollers with Foster's composition, and from that time steam printing was successful.

There are many roller makers, and as many recipes for making rollers; every one making some slight difference in his proportion of ingredients. It is hardly possible to give instructions to suit all countries, because much depends upon the climate and the state of the atmosphere.

The composition is a mixture of glue and treacle, mixed, in Europe, in the proportion of eight lbs. of the former to two of the latter, for

dry, cool weather; but here we use a far greater proportion of glue, as otherwise the rollers would be too soft and run off the frames.

To make new rollers in this climate the best proportion is 14 lbs. of glue and three pounds of treacle, which will make four ordinary sized press rollers.

In preparing to cast these, two lbs. of glue should be soaked in water, as soft and pure as can be procured. When thoroughly softened, put it in the melting kettle, and place it on the fire, stirring it with a wooden spoon. When quite melted add the rest of the glue in similar proportions (first soaking it) till the whole is melted. Boil gently for an hour, then add the treacle, well stirring the mixture until thoroughly incorporated. Boil and skim, stirring every ten minutes, for another hour, then leave the vessel to cool slightly.

While the composition is melting prepare the mould, by thoroughly cleaning it and rubbing the inside with oil, to prevent sticking. Place the wooden cylinder, or stock, in the mould, keeping it thoroughly dry, and then pour the composition carefully in; when cold, take out the roller, and cast again.

When old rollers are re-cast, the composition must be well cleaned with lye, before being melted. If the composition is very strong, add treacle and boil until it draws out well in threads, then cast. If the old rollers are too weak, or soft, boil until sufficiently firm.

Rollers should not be used too soon after being cast, as the type will cut up the surface, and become clogged in the face.

When rollers are soft, they must not be washed, as that will make them honey-comb, or go into holes.

When too dry, which with good management should seldom happen, a little water should be sprinkled on the table, and the roller be rapidly worked backwards and forwards, scarcely touching the table, until the water is soaked up.

The best way to preserve rollers when out of use, is to smother them in common ink, scraping them clean when required, with a blunt knife. This preserves the surface while it cleans the roller.

Ronde.—The name of an upright script type.

Rounce.—The drum or cylinder to which the girth is attached to run the carriage, or table of the press, in and out.

Rounce handle.—The winch used to turn the rounce.

Ruby.—The name of a type, one size larger than Pearl, and smaller than Nonpariel. There are 165 lines to a foot.

Ruck.—A term used to denote that paper is liable to crease or double when going round a cylinder.

Rules—Proper to be observed in a printing office.

1. Compositors will receive their cases free from all pie, with clean quadrat and space boxes; these must be kept while in use and returned when done with, in the same clean state.

2. When a compositor receives letter or other material from the foreman, he is to return what he does not use in a satisfactory state.

3. Matter is to be made up and imposed as soon as corrected.

4. No matter to be kept standing more than 12 days without special orders.

5. Forms, immediately they are imposed, are to be pulled and the proofs given to the reader. If a first proof, with the copy; if a second proof, with the foul proof.

6. If any pages of loose matter are left when a form is imposed, the imposer must secure them.

7. No imposer may leave a foul stone.

8. When cases are taken from the racks, the compositor must return them immediately he has done with them.

9. No cases to be placed over others, or on the floor under the frames.

10. All head lines should be cleared from galleys immediately after the last form of a work is put to the press.

11. Sweepings of frames must be cleared, every day, within half an hour after being picked up. Broken matter must be cleared the same day.

12. No compositor shall mix two separate founts without an express order from his foreman.

13. Two forms must not be stood down together without a partition between them.

14. The saw, bellows, waterpot, &c., are to be returned to their places as soon as done with.

15. No person shall make use of a bodkin, galley, or composing stick, not his own, without permission of the person in charge of the same.

16. No person shall misplace cases, or take an upper without the lower case, or vice versâ.

17. Pie of any sort must be cleared after five minutes notice.

18. No person shall take sorts from another's case without leave.

19. No person shall keep useful sorts by him, for which he has no present use.

20. Every part of the office must be swept twice a day, and types found on the floor be immediately cleared by the occupant of the frame from which they were swept.

21. No person shall be absent without leave.

22. Persons absenting themselves, except in case of sickness, and leaving copy unfinished, are liable to dismissal.

PRESSMEN.—1. Proofs must be pulled immediately upon notice being given.

2. Immediately after a proof is pulled, the form and chase is to be rubbed over with the lye brush, and then be given to the compositor to whom it belongs.

3. As soon as printed, each form must be carried to the lye-tub, and thoroughly washed, and then be delivered to the compositors for distribution.

4. All spoiled sheets must be returned. Any excess in the number of spoiled sheets will subject the pressman in fault, to fine.

5. Presses must be cleaned daily.

6. Faults in the rollers must be brought to the notice of the press overseer, who will see that all are kept in good working order.

7. No pressman shall work with a soft dirty roller, or one which has gone into holes.

8. Any pressman spoiling a roller by too frequent washing or soaking in water, shall provide another at his own expense.

9. Types or quadrats falling out on the press, must be immediately given to the compositor to whom the form belongs.

10. Any pressman delayed by compositors correcting revises, for a longer time than ten minutes, should report to his overseer.

Ruling Machine.—A machine for ruling red or blue lines in account books, blank statements, copy books, or any thing in which such lines are required. It is very simple in construction. At each end of a frame a wooden roller is affixed, one of which is turned by an handle. Round these rollers revolves a broad endless band, of canvass, or any substance sufficiently smooth and elastic. At one end is

a table, with moveable guages, on which to lay the sheets to be ruled, and a short distance from this is a broad clasp, formed of two pieces of wood united by screws, which holds the pens. These pens are formed of brass foil, and are simple channels, to convey the ink from its reservoir to the paper. The ink reservoirs are pieces of flannel, fastened with a nail to the clasp, just over and laying on the upper end of the pens, and thoroughly saturated by means of a small brush. When a sheet is to be ruled, it is laid on the table, touching a set of wheels which guide it on to the revolving band, and by the band it is carried under the pens, and ruled with as many lines.

Run in.—To run the table and form under the platten.

Run out.—To run the form from under the platten. Amongst compositors, to have emptied a case of any particular sort in composing, or to have used up all the copy in the office.

Runs on sorts.—When a book uses certain letters above the average.

Ruthven's Press.—See Machinery.

S.

Sanspariel Cases.—Cases with moveable bars, intended to hold large type.

Saw.—An implement for cutting wood. A small thin saw, with a back to strengthen it, is very useful in a printing office, for cutting furniture, &c.

Saw-block.—A piece of wood on which to cut wooden furniture to certain lengths. It should have two mitreing, or diagonal grooves, and one at right angles.

Scale board.—Thin slips of wood, used next to the crosses, to facilitate making register at press. Many use leads for this purpose.

Scandinavian Printing Machine.—A press invented by Mr. C. A. Holm, of Stockholm. The platten descends perpendicularly, as in the common press. The inking apparatus is so arranged that the distributing rollers have several motions, the object of which is to produce a perfectly uniform distribution of the ink. Where fine work is required, all the means of making ready are the same as at a common hand press ; while the facility for getting at forms for alterations, &c., is greater than at any other machine. It is capable of throwing off about 600 impressions per hour.

Script.—A type cast to imitate writing.

Section.—A mark (§) used to denote the division of a book or chapter into smaller portions. Also used as a mark of reference to notes.

Semicolon.—See Punctuation.

Set at Random.—To compose matter without making up.

Set matter.—Matter composed but not worked off. So called to distinguish it from distribution matter.

Set of sheets.—Sheets of waste paper placed upon the tympan sheet, and frequently changed to prevent the ink on the first side setting off, while working the second.

Sets off.—A sheet is said to set off when it parts with some of its ink to the sheet on which it is laid. The impressions in printing the second side of a sheet, will cause some of the ink from the first side to adhere to the tympan sheet, and this is likely to dirt succeeding sheets.

Set up close.—When compositors have set all their copy, so that there is none intermediate between them.

Seventy-two mo.—A sheet of paper folded into seventy-two leaves, or 144 pages.

Shank.—The body of the letter.

Sharp impression.—A clear, firm impression, with little indention on the paper.

Shears.—A large kind of scissors, with short blades and long handles, used to cut brass, leads, scale board, &c. to required lengths.

Sheep's foot.—An iron hammer, with a claw at one end, used by pressmen.

Sherwin and Cope's Press.—See Machinery.

Shooting stick.—An instrument used to assist in driving the quoins up with a mallet when locking up a form.

Short cross.—The shortest and broadest bar which divides a chase into quarters.

Short page.—A page not full of matter.

Side stick.—A wedge shaped piece of furniture placed on the side of the page to lock up by.

Signature.—A letter of the alphabet placed at the bottom of the first page of each sheet of a work, to denote the order of their succession. A small capital of the body fount is generally used.

Sixteen mo.—A sheet of paper folded into sixteen leaves, or thirty-two pages.

Sixty-four mo.—A sheet of paper folded into sixty-four leaves, or 128 pages.

Slice.—The false bottom of a large galley, made to slide out. Also, an implement used to take ink from the tub, or to scrape it together on the ink block.

Slips.—Matter pulled in long narrow pieces, for facility in correcting.

Slur.—A smear on the paper from any part of an impression.

Slur pin.—A flat headed pin that goes through the off-side of the outer tympan, near the head band, so as to rest on the chase or furniture. Its use is to prevent the off-corner of the tympan coming down on the types before the other parts, which when it happens causes slurring.

Small capitals.—Capitals of a smaller size than the regular capitals of a fount, but cast on the same body, to range with the lower case letters.

Small Pica.—The name of a type one size larger than Long Primer, and one size less than Pica. There are 83 lines to a foot.

Solid matter.—Matter that is composed without any leads between the lines.

Sorts.—The letters that lie in every box of a case are called sorts. Thus *a* is a sort; *b* is a sort, &c.

Space Lines.—Thin pieces of metal cast to various thickness, and of different lengths, quadrat high, to put between lines, or to white out titles, &c. They are generally called leads by printers.

Spacing.—The adjustment of the distance between the words in a line, so that there shall not be any glaring disproportion; also extending a word, or line of capitals, by putting spaces between the letters.

Uniformity in spacing is a most important part of the compositor's occupation, requiring both care and judgment; and, therefore, cannot be too strongly impressed on the mind of the young beginner. Very wide, or very close spacing are equally unpleasant to the sight, and ought never to be permitted, except in very narrow measures; and frequently, even in that case, it may be prevented. What is commonly called the composing space (the thick, or three to an em) should be as nearly as possible adhered to. It is not merely necessary to have a line here and there uniformly spaced, a careful compositor will

endeavour to give to every line and every page, that uniform appearance which is one of its chiefest excellencies. Careless and foul compositors will never preserve this most desirable uniformity; because, when their proof is crowded with corrections, the utmost care in rectifying them will not make the spacing regular.

In correcting, many compositors do not overrun the matter through the stick, as they ought to do, but prefer doing it on the stone, in which case they frequently hairspace, or treble space, in order either to get in or drive out a word; when by overrunning a line or two forward or backward, they would not only preserve uniformity, but also save considerable labour.

When a line is set, and requires additional spaces for justification, it is best to insert them where they will be least observed, as between perpendicular letters, such as d and h, or after a curved letter, as f. But the whole line should be spaced as nearly alike as possible by a judicious use of middling, thin, and hair spaces. In many cases it is well to change the thick spaces for en quadrats at such places as I have mentioned above, as the difference will be hardly perceptible to any but a professional eye. A thick and middling, or two thick spaces, in one place, and one thick only in another, should never be allowed, except in newspaper work—where speed is sometimes preferred to quality.

Where it may be necessary to reduce the spacing of a line, to get in the last letters of a word or syllable, the reduction should be rather made after a sloping letter, as w or y, than after a perpendicular one.

The spaces inserted after points vary. After a comma, a thick space is sufficient; the colon, semicolon, admiration, and interrogation, should have an hair space before, and an en quadrat after. The period is always followed by an em quadrat. In places where the admiration or interrogation are followed by capitals, to commence a sentence, an em quadrat may also be used. But these rules will not always hold good, as it may be necessary to reduce the space in these cases, as in the rest of the line, taking care to observe the same proportions.

Spaces are cast to such regular gradations, 3, 4, 5 and 7 to an em, that no sufficient excuse can be urged either for irregular appearance or bad justification.

Good spacing is a sign of a good workman.

Specimen page.—A page composed and pulled, as a sample of the type and paper intended to be used for any work.

☛ *Spottiswoode Press.*—A platten machine, the invention of Mr. A. Spottiswoode. It prints two forms at a time, which pass alternately under the platten, and will strike off about 600 impressions of each form in an hour.

Spring of a Form.—When a form has a great quantity of furniture in it and is locked up very tight, it frequently springs up in the middle so as to endanger its bursting upwards; it is then said the form springs; to remedy this, unlock the form, plane it down, and tighten again very gradually, frequently planing down while locking up.

Spur.—The projection on the point that strikes a hole in the paper while striking off the first side, and is used to make register with.

Squabble.—To twist, or displace the types in a page.

Stand still.—A term used by compositors and pressmen to denote that they are waiting for letter, copy, or a form to strike off.

Stanhope Press.—A press, gaining its power by a combination of the lever and screw, the invention of Earl Stanhope. It was the first iron press invented.

Stereotype.—The surface of a page of types cast in one piece of type metal, about the eighth of an inch thick.

Many attempts to procure casts of pages were made, and various systems of stereotyping were proposed in the 18th century, but none were thoroughly successful until the year 1800, when Lord Stanhope, after numerous experiments, at last introduced a plan which is even yet followed, and has never been improved upon in the quality of the work executed.

The first operation is that of taking a mould from each page of moveable types. The pages are not arranged as they would be combined in a sheet, and wedged up together in one iron frame or chase, but each page is put in a separate chase. It is essential that the face of the types should be perfectly clean and dry, and that no particle of dirt or other substance should attach to the bottom of the types, so as to prevent them being completely level upon the surface. The page thus locked up is placed upon the lower part of what is called a moulding frame, the upper part of which is somewhat larger than the page, and the margin of which thus formed determines the thickness of the plate.

The types, having previously been rubbed over with an oily composition, gypsum (plaster of Paris) mixed to the consistence of cream is poured evenly over the whole surface. This sets very quickly, and soon becomes perfectly solid. When dry the mould is removed from

the type. A great deal of nicety is required from the workmen in this operation, for if any part of the plaster adheres to the face of the type, the mould is of course imperfect, and the operation must be gone over again. Having been removed and found perfect, it is dressed with a knife round the edges, and several notches cut in the margin to allow the metal to enter the mould. It is now fit for backing, which process also requires a great deal of accurate knowledge. The oven in which the moulds are placed on their edges must be kept at a very regular temperature; for if it be too hot, the moulds warp. When backed the process of casting begins. For this a strong iron frame called a casting box, or casting pot, is used. At the bottom of the box is a moveable plate of cast iron, called a floating plate, and upon this plate, the face of which is perfectly accurate, the mould is placed with the face downwards. Upon the back of the mould rests the cover of the casting-box, the inside face of which is also perfectly true. The cover is held down tightly upon the mould by a screw, connected with two shackles, and also by two nippers connected with the apparatus for plunging the pot into the metal-pit. This apparatus, which is attached to a crane, is so constructed as to swing with a perfectly horizontal motion; and the casting box, with the mould, being thus suspended over the metal-pit, is gradually forced down into the molten metal, and there kept steady by a lever and weight. The lid of the box is cut off at the corners; and it is through these spaces that the metal enters the box, and insinuates itself into every hollow. When the box is plunged into the metal, a bubbling noise is heard, which is caused by the expulsion of the air within the box. After having remained immersed for about 10 minutes, it is steadily lifted out by the crane, and swung to a cooling trough in which the under side of the box is exposed to water. Being completely cooled, the caster removes the mould from the casting-box. The plaster mould, the plate mould, and the floating plate, are all solidly fixed together. The metal, by its specific gravity, has forced itself under the floating plate, which it has consequently driven tight up against the ledges of the mould. The mould has in the same way been driven tightly up against the lid of the casting-box. The notches in the ledges of the mould have at the same time admitted the metal into the minutest impression from the face of the types. The caster now breaks off the superfluous metal and the ledges of the mould with a wooden mallet; the mould is of course destroyed, and if another plate is required, another mould must be taken from the types. When the superfluous metal and the plaster are removed, the stereotype plate comes out bright and well formed, but perhaps not of the proper thickness, which can seldom be determined by the

mould; the back is therefore turned in a lathe, in which the plate revolves against a cutting tool, and a perfectly true surface is obtained by the superfluous parts being cut away in a series of concentric circles. The very best casting cannot prevent occasional defects in the face of the plate; it is therefore minutely examined by a workman called a picker. It is his business to remove the small globules of metal which occasionally fill up such letters as the *a* and the *e*; to insert a new letter, which he can do by cutting out the damaged letter, and soldering another in, if any one be broken; and, what is a still more delicate operation, to remove with his graver any impurities which may fill up the lines of a wood cut. When the plates have been carefully examined and passed as correct, they are ready for delivery to the printer.

But several patents have been taken out within the last few years, for a new, and as far as economy of cost and labour are concerned, an improved system of stereotype, known as the French, or papier maché process.

It is far cleaner and more rapidly executed than the old plaster casts, but the plates are not so clear and sharp; this may be improved by and bye,—the art being yet very young.

To take a mould on the papier maché process, the page is locked up as described before; but, instead of pouring liquid plaster on to the types, a prepared sheet, or flong, as it is technically termed, is laid upon it, and beaten with a long handled, hard brush. The flong is made of alternate sheets of blotting paper and a peculiar paste, and is used while yet wet; the beating, therefore, drives a part of it down into every interstice of the letter, no matter how fine. When sufficiently beaten the form, with the flong still on it, is placed on a heated iron plate, is then covered with a blanket, and a platten screwed firmly down. The type and mould is kept on this "moulding press" as it is called, for about fifteen minutes, and is then unscrewed, the blankets taken off, and left another ten minutes to dry. The mould is now lifted away, the edges trimmed with a pair of scissors, and little inequalities beaten down, and is ready for casting. The casting box and metal-pit are not used in this process, but the paper mould is laid on its back on the under side of a large iron "casting mould," bars of steel, the thickness of the required plate are placed round three sides of the margin of the mould to determine the size of the plate, the top is screwed firmly down, and melted metal is poured into the mould. As soon as set, the casting mould is unscrewed, and the platten and mould lifted away, and separated carefully. Sometimes the mould is destroyed, but now and then as many as twelve castings

may be taken from the same mould. The plate has now to be trimmed round the edges, and to be examined by the picker, and is then ready for the printer. The cost by this process is only about half of that of the old plaster process, and in England many newspapers, even dailies, are stereotyped, the types not being so much worn by moulding as by striking off a long number at press, besides the advantage of returning letter to the compositors immediately.

The process is by no means universally applied, but only in peculiar cases; while in those cases it is so valuable that it may be pronounced absolutely necessary. Works printed periodically, or long numbers, should always be stereotyped, as much time will be saved, and type preserved by the process.

Stet.—When a word has been struck out by mistake in reading a proof, it is usual to make dots under the word which has had the pen run through, and write the word stet in the margin.

Stickfull.—As many lines as will fill a composing stick.

Superiors.—Small letters and figures upon the upper part of the shank, to range with the top of the fount to which they belong. They are generally used as references to words; and occasionally for abbreviations, as M$^{r.}$ M$^{rs.}$ N$^{o.}$ &c.

Sweepings.—Types found on the floor when the rooms are swept. Those swept from the frames should be given to the persons working in them; those from the centre of the room to a person appointed for the purpose.

T.

Table work.—Here called statement, is figure column work, with rules between, consisting of five columns, or more. It is paid double the price of common matter.

Tabular.—Similar work to the above, but of three or four columns only. It is paid one and one half of common matter.

Tail Pieces.—Ornaments placed in a short page to fill up the vacancy.

Take Ink.—To dab the roller against the ink ductor for a fresh supply.

Take down.—To remove printed sheets from the lines with a peal when dry.

Take up.—To lift a quantity of matter either from a galley, or the imposing stone; or to lift a number of lines for distribution.

Take copy.—To receive copy from the foreman to compose.

Taylor and Martineau's Press.—An iron press on the knee joint principle. The power is regulated by a screw through the head.

Thermography.—Printing by heat. An invention for taking impressions, or facsimiles, showing the grain and general appearance of different kinds of wood. The process consists in slightly wetting the surface of the wood of which facsimiles are to be made, with any diluted acid or alkali, and then taking an impression upon paper. The impression is quite invisible, but by exposing it for a few moments to a strong heat, the impression appears in a more or less deep tone, according to the strength of the alkali.

Thick space.—A space, three of which are equal to an em, or the depth of the body of the letter to which they belong.

Thin space.—A space of which five are equal to an em, or to the depth of the body of the letter to which they belong.

Thirty-six mo.—A sheet of paper folded into thirty-six leaves, or seventy-two pages.

Thirty-two mo.—A sheet of paper folded into thirty-two leaves, or sixty-four pages.

Tightening the Quoins.—It is necessary now and then to examine any standing forms, as the quoins and side sticks are apt to shrink, and become loose, when the form will be in danger of falling out. If loose, they should be tapped up and tightened with a sheep's foot, or iron side stick.

Token.—A half ream of perfect paper, containing ten quires eighteen sheets, or 258 sheets.

Trafalgar.—The name of a type, the next size larger than Two-line Double Pica, and smaller than Canon. There are twenty lines to a foot.

Transpose.—To place pages or matter in their wrong order; also, to correct the wrong arrangement, and put pages, words, or lines in their proper place.

Turn for it.—When matter runs upon particular sorts, such as Capitals or Figures, it is usual if any run out before the rest of the case, to turn another letter of the same thickness up-side-down in its place until the necessary sorts are procured by distribution. This is called turning.

Twenty-four mo.—A sheet of paper folded into twenty-four leaves, or forty-eight pages.

Twenty-mo.—A sheet of paper folded into twenty leaves, or forty pages.

Two-line Double Pica.—A type, the next size larger than two-line Great Primer, and smaller than Trafalgar. There are $20\frac{3}{4}$ lines to the foot.

Two-line English.—A type one size larger than two-line Pica, and smaller than two-line Great Primer. There are 32 lines to the foot.

Two-line Great Primer.—A type, one size larger than two-line English, and smaller than two-line Double Pica. There are $25\frac{1}{2}$ lines to the foot.

Two-line Letters.—Capitals that are equal to two bodies of any specific sized type. They are made from two-line Diamond to two-line Great Primer, and are so cast that the face covers the whole square of the shank. They are known as titling letters.

Two-line Pica.—A type, one size larger than Double Pica, and smaller than two-line English. There are 36 lines to the foot.

Tympan.—A frame covered with linen, cloth, silk, or parchment, on which the sheet of paper to be printed is placed. This is the outer tympan; the inner fits into it, and between, the two blankets and making-ready sheets are placed, all which being run in receive the pressure of the platten, which produces the impression on the paper.

Tympan joints.—The joints by which the outer tympan is attached to the carriage on which it works.

Tympan sheet.—A sheet of paper pasted on the tympan by the corners as a mark by which to lay the sheets even in working. When a form is laid on the press, a sheet of the paper used for printing it, or of a similar size, is folded exactly into four. It is then laid on the form, with a sheet of waste under it, so that the marks of the folds fall exactly in the centres of the crosses. The tympan is wetted slightly, to take out the indentions caused by the preceding form, and is then turned down on the form, which is run in and pulled, so as to cause the sheet to adhere to the wet tympan. When lifted the corners are pasted down, with the exception of the bottom near corner; which is torn off, as it is likely to be taken hold of in removing the printed sheets when working.

Types.—The letters, marks and signs, cast in metal, or cut in wood, with which Printing is executed.

The types used for ordinary purposes are called Roman and Italic—all others are "fancy" founts.

Roman letter has long been held in the highest estimation, and is the national character wherever English is spoken, and also in France, Holland, Spain, Portugal, and Italy.

Italic was invented by Aldus Manutius, in 1496, and was originally used to distinguish such parts of a book as might not be considered strictly to belong to the body of the work; as Prefaces, Introductions, Annotations, &c., all which sub-parts of a work were formerly printed in this character. It is generally used for headings to chapters, to mark emphatical sentences, or to distinguish names of persons.

Two-line letters are used for displaying heads or titles.

Scripts of various kinds are frequently used in lieu of lithography, for circulars, letters, &c.

Black Letter, Egyptian, Clarendon, and other fancy types, are only used for headings, or for Job Work, such as cards or hand-bills.

The names of a great variety of types will be found in their places in the course of this book.

Type-founder.—A person who founds, or casts type.

As shown under the head "Printing," when letter press printing was first introduced, the types were cut from small pieces of wood, and after a short time, from pieces of metal. But another step was required to perfect the invention—the multiplication of separate letters by casting metal in moulds. All these gradations were the result of long and patient experiment, carried on by several individuals, who each saw the importance of the notion they were endeavouring to work out. It is this circumstance which has given rise to the interminable controversies as to the inventors of printing; and, as is usual in all such disputes, it was represented that the man to whom public opinion had assigned the credit of the invention had stolen it from another. As far as can now be ascertained, a man named Peter Schœffer, who was employed by Faust about the year 1455, was the first person who cast metal types. He shared his master's love for the art, and desired equally with him to improve it, and spent much of his time in endeavouring to simplify the method of making types. It should be remembered that the metal types previously in use were cut, not cast; they were carved on solid pieces, not shaped in a mould with melted metal. But Schœffer now formed them with the punch and matrix, tools which will be presently described.

Schœffer having privately made punches and formed matrices for the whole alphabet, cast some letters, and showed them to his master in triumph. Faust was so greatly surprised and delighted by the diligence and ability of his servant, that he took him into partnership, and finally gave him his daughter Catherine in marriage. A great thing had in truth been accomplished. Casting not only rendered the manufacture of types more easy and less expensive, but increased the beauty of printing; for though the metal types cut by hand greatly resembled each other, still there was some difference, and this gave an irregular appearance to the printing; but those cast by the matrix were alike, exact images of each other, and were therefore the more beautiful. At first, the metal used was not hard enough to bear the force of the impression, but the defect was soon remedied. The history of type-founding may be summed up as follows: The Chinese used block-printing 900 or more years ago; Laurence Coster, of Haarlem, invented moveable wooden types; Guttenburg, of Mentz, invented cut metal types; Schœffer invented cast metal types. After this, the knowledge soon spread.

The English printers, from Caxton to John Day, were all letter founders, but the trades, after this, began to be separated. Joseph Moxon, an early writer upon printing, says that in 1686 letter cutting was a handy-work, kept so concealed amongst the artificers of it, that he could not learn any one had taught it any other. In the reign of Queen Anne a great deal of type was imported from Holland, as the Dutch founders produced far more beautiful characters than the English. About the year 1700, William Caslon, who was employed in cutting letters and ornaments used by bookbinders, and in engraving on gun-barrels, was persuaded by Mr. Watts, an eminent printer, to attempt cutting punches for type-founding. He was first employed by the Society for Promoting Christian Knowledge, to cut the punches for a fount of Arabic, and succeeded so well, that he entered into the business of a letter-founder, in which undertaking he was assisted by Bowyer, a printer at that time. In a few years the English types were superior to any in Europe, and the demand for foreign founts had ceased. Caslon's letter became in demand on the continent, and instead of importing type from Holland, it was exported to that country in large quantities. Since that time English type-founding has steadily progressed.

The early printers and type founders were very imperfectly acquainted with the proper composition of metal to be used. Lead, as being the most flexible, was principally employed; but then it was too soft for durability, and a portion of iron was consequently added.

Regulus of antimony is now used instead of iron. The smallest sized types require the hardest metal, and the ordinary alloy for these is 25 parts regulus of antimony to 75 parts lead; the proportions vary to the larger sizes.

Types are cast in a matrix, which is formed by a punch. The punch is of hardened steel, and exhibits upon its face a single letter, formed by hammering down the hollows, and filing up the edges, when the metal was in a softened state. With this tool an impression is struck into a piece of copper, about an inch and a quarter long, one eighth of an inch deep, and wide in proportion to the size of the type to be cast. This is the matrix, which, after the die is sunk, is filled up, to ensure the cast taken from it being of the requisite depth. This process is called justifying. The mould is composed of two parts, the external surface of wood, the internal of steel. At the top is a shelving orifice, into which the metal is poured. The space within is formed by the intimate union of the two parts of the mould, each part forming two of the four sides of the letter; but although in two pieces, the space within is as true as though it had been hollowed out of a single piece of steel.

At the bottom of the mould, immediately under the orifice, is the matrix, which is held in its place by a metal spring.

The founder works at a little table, by the side of a small furnace. Taking a little metal out of the pot with a very small ladle, he pours it into the mould with his right hand, returns the ladle to the melting pot, and throws up his left hand, which holds the mould, above his head, with a sudden jerk, supporting it with his right hand. This movement forces the metal into all the interstices of the matrix, and without it the metal, especially in the smaller types, would not reach the bottom of the mould, for it could not force out the air by its specific gravity alone. As soon as brought down again the mould is unclosed, and the letter picked out with an hook attached to the top of one half of the mould. So rapid is the whole operation of pouring in the metal, throwing up the mould, unclosing it and removing the pressure of the spring, picking out the cast letter, closing the mould again, and re-applying the spring to be ready to repeat the whole act, that the average number of letters cast in an hour is 500.

When the type is turned out of the mould, a considerable piece of metal remains attached to it. This is removed by a boy who is known as the "breaking-off boy." The average number of letters broken off in an hour is 2,000.

From the breaking-off boy the types are removed to the "rubber." This workman sits with a round grit-stone table before him, upon which is a heap of types. The fore and middle fingers of his right hand are armed with a piece of tarred leather, and with them he passes each side of the type smartly over the stone, turning it, of course, in the movement. This is again, an example of wonderful rapidity; 2,000 types are thus rubbed in an hour.

From the rubber the heap is conveyed to a boy whose business it is to set up the types in lines, in a long shallow frame. The face of each must be uppermost, and the nicks outward. This boy works at about the same rate as the rubber.

The long frame, filled with a single line of type, is now taken to the "dresser." By the application of other frames he is enabled to dress, or polish them on each edge, and, turning them with the face downwards, to channel out, with a plane, a groove in the bottom, so that they will stand steadily. It will be at once understood how important it is that every letter should be perfectly square and true. If they were not of a uniform height, the impression could not be even; and if there were the least deviation from a regular form, it would be quite impossible that when 200,000 single letters are combined, as on one side of a large newspaper, they should hold together as they do, quoined up, as securely as if they were composed of one piece of metal.

Each letter being tied up into lines of a convenient length, the proportionate number of each variety, small letters, points, capitals, and figures are selected, and the fount is ready for delivery to the printer. Hand-made type is considered the best, but type is now made by machinery, at the rate of thousands instead of hundreds an hour. The machinery is, however, so complicated, that it is impossible to describe it with any chance of being understood. These machines are not altogether new in conception, although they have only been used for the last few years. Mr. Nicholson took out a patent for one in 1790, and Dr. Church, of Birmingham, obtained a patent in 1825 for a plan of casting 75,000 letters an hour. Mr. J. L. Pouchée succeeded in casting 24,000 letters an hour; and a machine was made by Mr. Applegath, and worked in the foundry at his office, in the year 1824. Machine-made type is more generally used in America than England, in the latter country accuracy and beauty being more highly esteemed by the tasteful printer than cheapness.

Machine-made, is not so lasting as hand-made type, the latter being generally hollow, and easily broken.

U.

Ultimate.—The last syllable of a word.

Underlays.—Pieces of paper, pasted on the bottom of an engraving on wood, to raise it to a proper height to print with types. Also pieces of paper placed under stereotype plates, to make the impression even.

Unlock the Form.—To loosen the quoins all round.

W.

Wash the Form.—To rub a form over with lye, and rinse it with water, after striking a proof, or when worked off.

Waste.—The surplus sheets of a work.

Wetting paper.—Preparing paper to be printed on. To wet paper, the wetter, or damper, places the dry paper on his left hand, with the backs of the quires towards him, so that he can readily catch them up. On his right is a board, which should be covered with a wrapper, to prevent the bottom sheet being stained. The back of the quire is now taken in the right hand, the fore-edge in the left, and the paper is drawn quickly through the water, back first. About half of the quire is then opened on to the board, and the other half is again dipped, and opened on the first, and so on to the end of the heap. When all is damped, a board is placed on the heap of wet paper, with weights on the top, to squeeze out the superfluous moisture. This is left to stand till the sheets are uniformly damp throughout, and is then ready for the pressman.

Wheel.—The drum or cylinder to which the two girths of the press are affixed, and by which the table is run in and out.

White line.—A line of quadrats, or blank space, equal in depth to a line, between two other lines.

White page.—A blank page.

White paper.—When pressmen are printing the first side of a form, they say they are working white paper.

Wide spacing.—Using en quadrats, or more, between the words throughout a line or page.

Wood letter.—Large type for posting bills, &c. is usually cut in wood, to save weight and expense.

Worked off.—Struck off, printed.